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Bovine Mastitis*

A. W. STABLEFORTH,

DIVISION OF PREVENTIVE MEDICINE,
ROYAL VETERINARY COLLEGE,
LONDON

It is generally agreed that mastitis is of outstanding importance to the dairy farmer and the cause of considerable yearly loss. In the acute forms of the disease, there may be loss of the quarter or of the cow, whilst in the widespread chronic contagious form, there is not only the loss of milk which is obviously unfit for sale, or obvious reduction of yield in the old-standing individual case, but also a considerable lowering of yield from udders which are infected but which appear normal. Other factors of importance are the changes produced in the quality of the milk which, though not rendering it grossly abnormal, may make it unsuitable for various dairy purposes, particularly cheese-making. These changes include increased alkalinity and salt content and decreased casein, fat and sugar content. Another point, of some public health importance, is the fact that mastitis is occasionally caused by streptococci implanted in the udder from a human source; the inclusion of such milk in the ordinary supplies has in the past given rise to widespread outbreaks of septic sore throat or of scarlatina among the consumers.

Whilst actual outbreaks of mastitis, particularly when of a severe type, at times cause considerable loss of milk, there is evidence that, in the aggregate, much greater loss arises from the lowered milk yield associated with the common chronic contagious form of the disease. The incidence of this form of mastitis is high, observations in this and other countries having shown that most herds are infected to some extent and that the average incidence may be put at not less than 20 per cent., the animals being affected on an average in two quarters. The proportion of infected cows which show severe symptoms at any given time may be 25 per cent. or more, but is usually small.

Several attempts have been made to estimate the loss due to the lowering of milk yield referred to above and some details of two of these, which have recently been recorded, may be of value here. In the first, a comparison was made of the yields of opposing infected and uninfected quarters of 86 cows selected because they were infected in one quarter or one side of the udder only. It was found, after allowing for the average variation found in the milk and butter-fat production of opposing non-infected quarters of the same cow, that mastitis decreased the milk yield by approximately 21 per cent. and the butter fat by 25 per cent. The second study was a more extensive one: a comparison was made of the yields of approximately equal numbers of infected and non-infected cows in three herds, covering in all 373 lactations, 180 in Ayrshires and 193 in Friesians. Full corrections were made for the number of calvings, length of dry period, service period, month of calving, etc., whilst cows also infected with contagious abortion, the only other disease of any importance present, were considered separately from those which were not so infected. A statistical examination of the figures showed that there was a loss in yield, due to mastitis alone, of 10·8 per cent. in the Ayrshires and 16·5 and 19·5 per cent. respectively in the two herds of Friesians. Taking the lowest of these figures (10·8 per cent.) and the price of milk at one shilling per gallon, a simple computation will show that the loss incurred is £2 to £5 per infected cow according to the normal yield which would be expected; and that, taking the total number of cows in Great Britain as 2,700,000, the percentage infected as 20 per cent., and the average expected yield as 400 gallons per annum, the gross loss to the farming community caused by lowered milk yield alone would be well over £1,000,000 per annum. It is, moreover, important to emphasise that the mastitis in the herds on which these figures are based was mainly of the chronic contagious variety, that relatively few cows had lost a quarter on account of the disease and that there was no actual outbreak of clinical mastitis. The estimate is, therefore, in all senses conservative.

*Based on an address to the Mid-West Division, N.V.M.A., at Bath, October 21st, 1938.

The Various Kinds of Mastitis and their Causes

Whilst all serious mastitis is associated with bacterial growth within the udder, there are certain other factors which may assist in the process of infection or the development of the disease. Such auxiliary or predisposing causes include bruising, overstocking or any other factor which prevents the proper emptying of the udder. Draughts or any other agent which chills the surface of the udder may also be of importance. Small sores or wounds, particularly at the end of the teat, may assist infection. These factors are probably not of primary importance in themselves, but may assist the entry or multiplication of potential disease-producing organisms.

It has long been recognised that there are various kinds of mastitis, but it is probably not yet realised sufficiently that these are not due to differences in the effects of one organism, but rather an expression of the effects of different organisms. The practical importance of this is that methods of treatment or control which are applicable to one kind of mastitis may be quite useless when applied to another.

The following are the organisms which most commonly cause mastitis:—

Str. agalactiae which causes the common chronic contagious mastitis of milking cows; *other streptococci*, which generally cause mastitis of a more acute type; *Corynebacterium pyogenes*, which causes "summer mastitis"; *staphylococci*; and *tubercle bacilli*. Mastitis is also sometimes caused by other organisms such as those of the coliform group, but it is not intended to deal with these or with tuberculous mastitis here.

Str. agalactiae is also often called *Str. mastiditis*, particularly in North-American literature, and was originally called by us "Group I mastitis streptococcus." It also corresponds with the Group B streptococcus of Lancefield's classification. The "other streptococci" which cause a more acute mastitis are usually those which we called "Group II and Group III mastitis streptococci" respectively when we first showed their relation to mastitis, and for which the names *Str. dysgalactiae* and *Str. uberis* have since been put forward.

Str. agalactiae Mastitis.

This is the common chronic contagious mastitis and the vast majority of cases in milking cows are of this nature. It may, at times, be severe at the outset and spread quickly in the herd, but it usually starts in a chronic and insidious manner. Severe clinical symptoms are often a result not of a recent infection but of a flare-up of an infection of some standing and which occurs owing to certain auxiliary factors, *e.g.*, an injury or the installation of a milking machine. Usually the first symptom is the appearance of small clots in the fore milk of one or more quarters, the milk often becoming watery in appearance. These signs, though perceptible to the milker, are often disregarded and in no way associated with mastitis, or "garget." They are, however, part and parcel of the disease. If milk samples are taken periodically, the same causal organisms can be isolated with regularity, often in large numbers, and appropriate tests will usually show other evidence of inflammatory changes. If an infected animal is regularly and completely milked and subjected to no untoward influences, it may show no marked symptoms for some time. Sooner or later, however, the symptoms generally become more obvious; clots are found with greater regularity and throughout the greater part of the milk, and the udder becomes hard. It is only when this happens that an infected quarter is generally recognised as a diseased quarter. Obvious symptoms of the disease may occur soon after calving, but more often are first noticed later in lactation or during drying off. It should be noted that the cow never shows constitutional symptoms. Infection usually persists throughout the dry period and no immunity is produced by one attack.

All the evidence goes to show that this form of mastitis is in most cases spread unwittingly by the hands of the milker or by the teat cups of the milking machine because, whilst infection can be artificially produced *via* the teat canal, it cannot be produced experimentally by any other method. This form of mastitis owes its importance to the facts that it is widespread and its early stages are often overlooked although the cow may be giving less milk than she should, that its incidence and effects increase with age—animals of five or six years which should be at the peak of their milking capacity being far more frequently and seriously affected than younger animals—and, finally, because it is contagious.

Other Forms of Streptococcus Mastitis.

Under this heading are included those more acute forms of mastitis which are caused by streptococci other than *Str. agalactiae*.

The most common of these are Group II or III mastitis streptococci. The total amount of mastitis caused by these organisms is relatively small, but it may assume great importance in certain herds. Symptoms develop quickly. There is painful and tense swelling of the quarter, often referred to as a "ballooning," the milk yield drops suddenly and the normal secretion is replaced by a watery, slightly yellowish fluid containing a small or large amount of clotted material. The teat may also be involved and in these cases it may be difficult to obtain any secretion in the early stages. At times acute symptoms recur at intervals of a few days. In the milder cases the milk may become normal

again in quality and appearance within 24 to 48 hours, but in many cases the symptoms rapidly progress and the quarter is lost in a few days to a week. There is no pronounced systemic disturbance. These infections may sometimes become more chronic, leading to a gradual loss of the quarter over a matter of weeks or months. In contrast to *Str. agalactiae* infections, however, they are characterised by their acuteness and the fact that the infection is usually not detectable more than a few hours before symptoms appear, and usually disappears when the symptoms abate. The disease caused by Group II and III mastitis streptococci is, therefore, sporadic and due to the infection of the quarter with organisms which only produce disease when the gland is for some other reason in a susceptible condition. It is clearly distinguished from *Str. agalactiae* in which the reservoir of infection is another infected animal.

Acute mastitis may also be caused by two other kinds of streptococci, both actively haemolytic, *viz.*: (1) a variety of group C (Lancefield) streptococci, which has been called the "animal pyogenes" streptococcus (our original S 21 series streptococcus), and (2) *Str. pyogenes* itself (the group A streptococcus of Lancefield). The general symptoms in both cases are usually those of an acute mastitis and similar to those referred to above.

Infections with the so-called "animal pyogenes" streptococcus (streptococci of group C) are relatively uncommon but are usually serious and followed by loss of the quarter; their occurrence is sporadic, though in one case in our experience four cases in one herd occurred at about the same time.

Infections with *Str. pyogenes* (group A streptococci) are rare; the mastitis is usually severe but the secretion may continue for some time, and in one case on record a cow which had obvious mastitis in one quarter also secreted large numbers of streptococci for a considerable period from an apparently normal quarter—a point of some epidemiological significance. The source of infection in these cases is a human carrier of *Str. pyogenes* and the cases are important because they have, as already stated, given rise in the past to widespread epidemics of scarlatina and septic throat amongst human consumers of the infected milk.

Corynebacterium Pyogenes Mastitis (Summer Mastitis).

This type of mastitis occurs mainly during the warm months of the year and usually in dry cows or heifers at grass. It may, however, occasionally occur in lactating cows and some cases are found throughout the year. The incidence varies from district to district and from year to year but the disease is often of serious economic importance. In this form of mastitis, there is suppuration of the udder tissues with the production of a foul-smelling, greenish-yellow or blood-stained purulent secretion which is often very difficult to withdraw by stripping. The quarter is at first very inflamed and is nearly always lost. Severe constitutional symptoms are often shown, the animal being off its feed, and death may follow. Sloughing of the quarter as a whole is not usual but abscesses may form and break externally.

The method of infection is not certainly known. It cannot be during the process of milking because the teats of many of the infected animals have never been handled. It may well be endogenous, resulting from an original infection during calf-hood, because it is known that *Corynebacterium pyogenes* infections, *e.g.*, of the lungs, are not uncommon amongst calves and that infections of the udder may appear in quite young heifers. In adults, flies are often regarded as of importance in spread, but there is little definite evidence to support this and the theory does not altogether fit in with the epizoötiological data.

Staphylococcus Mastitis.

Staphylococci are often present in the udder and may be responsible for chronic changes of a mild nature, but, on the whole, cause little trouble. In certain cases, however, they may for some reason increase in number and produce obvious symptoms, sometimes of an acute nature associated with marked systemic disturbance. Necrosis and subsequent sloughing of the affected tissues may occur. In some of these cases, complicating anaerobic infection leading to "gangrenous mastitis" appears to be a factor, but in many cases the necrosis appears to be caused solely by the staphylococcus toxin. Death of the animal from toxaemia is frequent. The more severe forms of staphylococcus mastitis, though serious, are relatively uncommon.

Diagnosis

The distinction between the more severe types of mastitis can often be made on clinical grounds, but in many cases a cultural examination is the only way of distinguishing the various udder diseases described and, in the common chronic contagious mastitis caused by *Str. agalactiae*, it is the only way to detect satisfactorily the latent or hidden cases. The detection of these latent infections in the early stages has been recognised as of importance wherever mastitis has been studied, and numerous methods have been put forward for this purpose. These methods fall into two categories, *viz.*, direct methods, in which a search is made in one or other way for the

causal streptococcus; and indirect methods, in which an attempt is made to detect the effects of the organisms concerned. Of these indirect methods only clinical examination, examination of the foremilk, and the brom-cresol-purple test will be considered in any detail.

Clinical Examination.—The value of clinical examination, in the sense of udder palpation and examination of the gross character of the secretion, is a subject on which much difference of opinion exists. It we look for the reason, we shall, I think, find that this difference of opinion is due to a difference of outlook, dependent on the purpose for which the examination is being made and on the fact that some kinds of mastitis develop more quickly than others. If the control of mastitis is looked on mainly from the point of view of preventing grossly abnormal milk or pus from getting into the milk supply, then clinical examination will be regarded as of considerable value and perhaps all that is required. If, on the other hand, an attempt is to be made to prevent the spread of infection, then methods of diagnosis which will enable infection to be detected in its early stages must be used. Again, if the mastitis is of the acute kind, it will in practice quickly be seen by the cowman or detected at a clinical examination. If, however, the mastitis is of the slowly developing kind—and the most common form of bovine mastitis is typically chronic and insidious—then it could not and, in the view of most experienced observers, is not detectable in the early stages of clinical examination or, indeed, sufficiently regularly by any of the indirect methods.

The examination of fore milk for small flakes or clots.—Another method of some value in detecting cases before they show obvious clinical manifestations is the examination of the fore milk by the use of a strip cup or a plate with a dull black surface on to which the fore milk is drawn and which shows up small clots or flakes in the milk.

The use of Brom-cresol-purple or some similar indicator intended to detect the abnormal alkalinity commonly found in mastitis is also of some value. In one method, the indicator is added directly to the milk. In another method, papers impregnated with indicator are used. Brom-cresol-purple papers are yellow before use and become slate-grey when wetted with normal milk, but purple when wetted with mastitis milk. In the tube test, the indicator is dropped into the milk, a dove-grey or slightly purplish colour being developed in the case of normal milk and purple in the presence of mastitis milk. Brom-thymol-blue is also used and gives a greenish colour with normal milk and a bluish-green or nearly blue colour with abnormal milk. Abnormally acid milk may also be detected by either of these two indicators, being yellow in both cases. These tests are only reliable when cows are in full milk and for milk from individual quarters. They cannot be used for cows which have recently calved or which are reaching the dry stage. A certain number of indefinite reactions are to be expected. The results also vary from day to day so that the optimum benefit is only obtained by repeating the test at short intervals.

There are certain other indirect tests which have been used and are considered by some to be of value, *e.g.*, the catalase, chloride, rennet and casein number tests.

In general, the conclusion has been reached that, whilst these indirect tests may be of value if positive, they fail to detect many of the early cases on the one hand and, on the other hand, make no distinction between the different kinds of mastitis. The combination of udder palpation and one or other of the indirect tests has been used but even such a combination misses many of the early cases.

The direct tests may be carried out in many ways but in all except direct microscopic examination an attempt is made to cultivate the causal organism. Direct microscopic examination is of little value because by its use less than a third of the infections can be detected. The cultural tests have the disadvantage that they must be carried out by a laboratory which is familiar with this kind of work but have the advantage that they detect many infections which are otherwise missed and also that they indicate the exact type of udder disease present.

Treatment, Prevention and Control

Whilst laboratory milk examinations are to be recommended where possible so that infected cows may be milked last or otherwise segregated, much can be done by attention to the ordinary sanitary principles.

General Hygienic Precautions.

Animals which show any signs of udder disturbance should be handled by a special attendant or after the normal animals have been milked. Udder cloths should be clean and frequently changed; fore milk should be collected in special vessels and destroyed; the milkers should wash their hands, where practicable, between the milking of each two cows; thorough milking, particularly at the end of lactation should be insisted on; injuries, cracks and sores should be treated immediately; teat syphons, where used, should be sterilised; milking machines should only be used for healthy animals. Due attention should be given to general conditions and feeding, and to disinfection. The use of a suitable disinfectant such as a chlorine solution is of value, and may be used in the water for washing the milkers' hands or teat cups and for the water used for udder washing. A suitable chlorine preparation

has the advantage that it does not taint the milk and, when used at the proper strength, will kill mastitis streptococci in milk in 15 to 60 seconds. If no laboratory examination of the animals has been carried out, it is an advantage to milk the younger cows first unless they have shown symptoms of disease. In the more acute types of streptococcus mastitis, it may be of importance to consider the type and vacuum employed in the milking machine, if used. In two herds in which very considerable trouble had been experienced from this type of mastitis, a reduction of the vacuum from 15 to 13 was followed by very satisfactory results. Whilst this may not be cause and effect, it is well worth bearing in mind.

Immunisation.

Widespread efforts have been made to control chronic streptococcus mastitis by means of stock vaccines or by autogenous vaccines made for a particular herd. Both good and bad results have been obtained, but the evidence from those experiments in which vaccinated animals have been compared with similar numbers of unvaccinated animals in the same herd has shown that vaccination does not rid them of infection in the udder but at most makes the disease less obvious. Vaccination therefore merely hides the disease to some extent and is to be deprecated.

With regard to staphylococcus mastitis, it has recently been shown that the staphylococcus concerned excretes a powerful specific toxin and in this disease a trial of an antitoxin in the acutely affected individual animal, or of formolised toxin or toxoid as a preventive where cases are frequently occurring, might be worth while. In the case of summer mastitis, it has recently been shown by one of the writer's colleagues that *Corynebacterium pyogenes* also produces a toxin and we should welcome co-operation in the testing of a toxoid made from this under field conditions.

Treatment by Udder Injection.

Various chemical substances have, in the past, been used in an attempt to sterilise udder infections by injection *via* the teat canal, but most are too irritant at bactericidal concentration. As stated, however, in a paper dealing especially with this aspect and published in the *Veterinary Record* in June, 1938, certain of the acridine dyes have proved of considerable value. Entozon 1 : 1,250, and acriflavine 1 : 10,000 have been found to be two of the most effective agents. Their efficiency appears to be about equal, but acriflavine has the advantage that it causes rather less disturbance to the udder. In latent cases, and in clinical cases in the early stages, it has been found that from 60 to 80 per cent. of infected quarters are cured by two treatments. The treatment of old-standing infections is not satisfactory because sterilisation of the infection is more difficult (in our experiments, we only succeeded in curing about 30 per cent. of such infections) and because destruction of the udder tissue is often such that a return to normal function could not be expected. The injections can be made while the cow is in full milk, and in that case the sterilising solution is left in the udder for four to five minutes, the treatment being repeated at the end of a week. The milk is altered or discoloured for several days and there is a temporary reduction in the yield which may not become normal until the end of about a week. In view of this, treatment is often preferred by the owner towards the end of lactation when the loss of milk is of less importance. Treatment may also be carried out during the first half of the dry period when the infusion may be left in for 18 to 24 hours and treatment repeated after a week. There appears to be no difference in the efficacy of treatment carried out when the animals are in milk or during the dry period. One advantage of carrying out treatment towards the end of lactation is that if it fails, a further attempt can be made during the dry period. Treatment should in general be carried out as early as possible and is of particular value in young animals infected in one or two quarters.

It is often a valuable adjunct to control in herds which are being regularly examined and in which the infected cows are being milked last or otherwise segregated. In this case the result of treatment must be assessed by subsequent laboratory examination of milk samples.

Chemotherapy by Oral or Parenteral Routes.

In view of the fact that udder injections, however carefully carried out, always cause some loss of milk, we are at present making an attempt to find out whether streptococcus infections of the udder and, in particular, *Str. agalactiae* infections, can be cured by the administration of sulphanilamide *per os*. This substance has proved of considerable value in combating certain streptococcus infections in human beings and, whilst bovine mastitis differs in that it is a chronic condition in which one has to deal with a massive local infection, it was considered worth while to test its effects. The experiments are not yet finished but some interim report may be made at this stage.

The probable result appears to be that whereas sulphanilamide, when given in doses which produce a high concentration in the milk, is often followed by a spectacular improvement in the character of the secretion, it does not get rid of the infection. The clinical result has, in many cases, been quite striking and suggests that its use may be of value in acute cases.

Complete sterilisation of the infection seems, however, to be an infrequent result.

No reference has been made to symptomatic treatment of a general or local nature but emphasis may be laid on the value of thorough stripping and massage of affected quarters and of all measures conducive to the removal of abnormal secretion. Heifer and dry cows should be looked over frequently on farms where summer mastitis is likely to occur, in order that prompt local treatment may be adopted. In such herds fly-repellents may be applied to the teats, and attempts made to prevent possible infection by this route by the injection of soft antiseptic pastes into the teat before turning out dry.

The Building Up of Herds Free from Chronic Streptococcus Mastitis

There are two outstanding facts to be borne in mind in building up herds free from the ordinary chronic mastitis, *viz.*, firstly that this kind of mastitis is contagious and spread by the milkers' hands or by the teat cups, and secondly, that many apparently normal animals are infected and a danger to other animals. The first thing of importance is, therefore, to take measures to detect not only the advanced cases but those in which the disease is present in a latent or hidden form. This can best be done by suitable laboratory examination. The next step must be to use all practicable precautions to prevent the spread of infection. Infected cows should be milked last or by a separate cowman or machine unit and, if practicable, put at one end of the shed or in another shed. Badly infected animals should be disposed of and all infected animals considered for disposal if they are not good milkers, are getting old or are affected with other diseases, *e.g.*, abortion or tuberculosis. There is no need to get rid of infected cows which are milking well and otherwise normal. Those which it is proposed to keep may be treated by udder injection. The examination of milk samples from the clean section of the herd should be repeated after an interval of three months and at intervals later according to the results. Heifers and young cows will usually be clean. It sometimes happens that owners do not feel that they can have their whole herd examined and much would be achieved if, in their case, an endeavour were made to protect the incoming heifers from infection from the older cows by putting them in a separate cowshed or by milking them first or separately. If possible, milk samples should be examined a week or ten days after calving because an occasional heifer does prove to be infected.

The results of control in the way outlined above have, on the whole, been good, though experience has taught us that the final eradication of the disease usually takes some time. In nearly all herds new infections have gradually decreased, in most they have become few, whilst in some, they have now been absent for a considerable period (up to six years). Apart from certain of the older infections which still remain in some herds, clinical *Str. agalactiae* mastitis has practically disappeared, which means, in effect, that with one or two exceptions healthy udders are the rule.

In conclusion, there are three points with regard to bovine mastitis which are of major importance. Firstly, the term mastitis covers a variety of infections of the mammary gland which are properly looked upon as distinct diseases, arising in different ways and requiring different methods of control. Secondly, in the common chronic contagious mastitis which is, on the whole, of much greater importance than the others, there are a large number of latent or hidden infections, that is to say, infections which produce few or no symptoms in the early stages and can quite often only be detected by cultural examination of milk samples. These latent or hidden infections are important because they eventually lead to a more marked and clinical disease in many animals and are a continual source of danger to other animals in the herd. Thirdly, the financial loss from mastitis is much greater than has been realised in the past because there is now evidence that even in its latent form, the common chronic form of the disease causes a considerable diminution in the milk yield.

Bibliography

Papers which have been published in British journals and contain more detailed information and reference to foreign work include the following:—

Bacteriology

Minett, F. C., Stableforth, A. W., and Edwards, S. J. (1929.) *J. comp. Path. & Therap.* **42.** 213.

——— ———. (1931.) *J. comp. Path. & Therap.* **44.** 114.

——— ———. (1934.) *J. Dairy Res.* **5.** 223.

Edwards, S. J. (1932.) *J. comp. Path. & Therap.* **45.** 43.

Diagnosis (in the Field and Laboratory)

Stableforth, A. W. (1930.) *J. comp. Path. & Therap.* **43.** 22.

Minett, F. C., Stableforth, A. W., and Edwards, S. J. (1930.) *J. comp. Path. & Therap.* **43.** 163.

Edwards, S. J. (1934.) *J. comp. Path. & Therap.* **47.** 49.

Selective Medium for Diagnosis

Edwards, S. J. (1933.) *J. comp. Path. & Therap.* **46.** 211.

The More Acute Forms

Minett, F. C., Stableforth, A. W., and Edwards, S. J. (1932.) *J. comp. Path. & Therap.* **45.** 1.

Control

Minett, F. C., Stableforth, A. W., and Edwards, S. J. (1933.) *J. comp. Path. & Therap.* **46.** 131.

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Causes of Condemnation by Meat Inspectors of Fowls of the "Old Hen" Class

E. G. WHITE and A. A. B. ELLIS

Research Institute in Animal Pathology, Royal Veterinary College, London

Through the kindness of Mr. L. B. A. Grace, M.R.C.V.S., D.V.S.M., Veterinary Officer and Chief Meat Inspector, Smithfield Markets, we were enabled to investigate the causes of condemnation by meat inspectors at Smithfield Market during April to June, 1938, and January to February, 1939, of a number of fowls of the class known in the trade as "old hens." In this class of bird, Mr. Grace informs us that the number confiscated in consignments from the United Kingdom and from Eire is very large. No accurate figures are available of the proportion of condemned fowls in relation to the total number of birds coming to the market, but in individual consignments the proportion ranges from as low as 5 per cent. to as high as 60 per cent. In other markets, the proportion of birds confiscated will vary with the extent and thoroughness of the inspection.

The carcases, 250 in all, were selected by us at random from the pile of condemned fowls: in the case of very large batches every second or third fowl was taken whilst in small batches every carcase was examined. The average age of fowls of this class is probably between one and two years and the birds represent in the main the culls of the poultry industry.

The technique adopted in carrying out the autopsies was intentionally both simple and rapid, the average time taken for each bird being about ten minutes. In every case, diagnosis was confirmed by smears, frozen or paraffin sections, or by both methods. A diagnosis of tuberculosis was made only after finding typical acid-fast organisms in smears, usually from lesions in more than one organ, and in some cases this was confirmed by histological examination. It is necessary to stress the rather superficial method of examination adopted and the nature of the fowl population examined. All the internal organs were examined macroscopically but the intestines were not opened in every case. In a large number of birds, the bone marrow was examined macroscopically for the presence of tuberculosis since several workers have recorded a high incidence of lesions in this situation. It is clearly not practicable to examine every bone and it was decided to make a diagnosis on the macroscopic appearance of the bone marrow of both *femora*, the bones being split open with bone forceps. The incidence of tuberculous lesions in the bone marrow which we have recorded would almost certainly have been considerably higher if more bones had been examined.

In a number of birds, special attention was paid to the so-called "neck glands" since it has been suggested that the condition of these affords a useful indication of the presence of tuberculosis. It has even been stated that it is not necessary to open the bird in order to diagnose the disease *post-mortem*, palpation of these "glands" being adequate. In the first place, there is considerable ignorance as to the nature of these structures. Land fowl have no lymph glands which resemble macroscopically those of mammals, although two pairs are to be found in water fowl. The "neck glands" in reality represent the thymus which is in the form of a long chain of lobules running on either side of the neck along the course of the jugular vein. Tuberculosis of the thymus occurs during haematogenous spread and is found only in generalised tuberculosis, usually in the most advanced cases. Even in the latter, our results show that it occurs in only 20 per cent. of birds. A full description of the thymus in the fowl and of its involvement in tuberculosis is given by Seifried (1924). He found the thymus affected in only 10 out of 50 tuberculous fowls and these birds had died or had been destroyed on account of tuberculosis, whereas the birds which we have examined had been sent to the market for food purposes.

Stableforth, A. W., Edwards, S. J., and Minett, F. C. (1935.) *J. comp. Path. & Therap.* **48.** 300.

Public Health
Minett, F. C. (1932.) *Vet. Rec.* **44.** (N.S. **12.**) 544.
Pullinger, E. J. (1935.) *J. Dairy Res.* **6.** 369.

Milk Yield
Minett, F. C., and Martin, W. J. (1936.) *J. Dairy Res.* **7.** 122.

Treatment
Stableforth, A. W., and Scorgie, N. J. (1938.) *Vet. Rec.* **50.** 663.

Serological
Stableforth, A. W. (1932.) *J. comp. Path. & Therap.* **45.** 185.
———. (1937.) *J. Path. & Bact.* **45.** 263.
———. (1938.) *J. Path. & Bact.* **46.** 21.

Staphylococcus Mastitis
Minett, F. C. (1937.) *J. comp. Path. & Therap.* **50.** 101.

General or Review
Minett, F. C. (1934.) Proc. 12th Internat. Vet. Cong. p. 511.
Stableforth, A. W. (1938.) *Agr. Progress.* **15.** 8.
Edwards, S. J. (1936.) *J. Dairy Res.* **7.** 291.
———. (1938.) *J. Dairy Res.* **9.** 356.

Table I.

Summary of *Post-mortem* Findings.

Main Lesions.	Origin of Birds.	
	Eire.	United Kingdom.
Total No. ...	120	130
Tuberculosis...	72	73
"Fatty Liver"	25	10
Carcinoma of ovary	8	12
Ovarian infection	10	8
Cyst of right oviduct	3	4
Neoplasms (other than of ovary) ...	2	5
Neurolymphomatosis, Leukaemia...	3	19
Miscellaneous	4	11

Some of the birds showed more than one pathological condition, *e.g.*, there were several cases of tuberculosis and cystic right oviduct, and two cases of fatty liver together with tuberculosis. In Table II is shown the distribution of the macroscopic lesions in the 145 fowls affected with tuberculosis.

Table II

Number of Birds.	145	Eber's figures (346 Birds).
Liver...	145 (100%)	95%
Spleen	135 (93%)	82%
Intestines	94 (65%)	73%
Lungs	29 (20%)	41%
Crop	1	
Proventriculus ...	6 (7%)	6%
Gizzard	3	
Bone marrow ...	*52 (73%)	***90%
Thymus ("neck glands")	**23 (20%)	20%
Joints...	0 (0%)	0%

* 71 birds examined.
** 118 „ „
*** 58 birds; all bones examined.

It will be seen from the table that tuberculous lesions were found much more frequently in the bone marrow, even when only two bones were examined, than in the thymus, where they were found in only 23 out of 118 tuberculous fowls.

Intestinal lesions are probably more frequent than the above figures suggest, since small lesions can be detected only after opening the intestines. We met with no instance of tuberculosis of the joints or of the eye. In view of the fact that "going light" is usually considered one of the characteristic symptoms of tuberculosis, the carcases have been classified according to their general condition as follows:—

Good or very good	36 birds
Fair	59 „
Poor or very poor	50 „

It will be seen, therefore, that many fowls affected with tuberculosis, even when generalised, may be in good bodily condition. In birds dying of tuberculosis, on the other hand, the general condition is usually very poor.

A condition termed "fatty liver" was especially common in the fowls from Eire. In these birds, the liver was yellow in colour, soft, and usually showed numerous small bright yellow foci which were paler in colour and softer than the surrounding liver tissue. Histologically, the liver was fatty, the small foci showing a more marked fatty infiltration than the intervening liver tissue. The yellowish foci may be confused with tuberculous lesions but differential diagnosis is usually easy—the carcase is almost always characterised by an excess of yellow body fat, the liver lesions do not show a central yellow area of caseation and a greyish periphery and are much softer than in tuberculosis, and there are no lesions in the other organs. Occasionally, tuberculosis and "fatty liver" may be found in the same bird. The condition of "fatty liver" appears to be associated with overfeeding with maize. There is no reason for the condemnation of such a carcase if free from other pathological conditions; in our series of cases, however, there was usually some concomitant condition sufficient to warrant confiscation, *e.g.*, tuberculosis, oviduct cyst, or ovarian infection. The experienced meat inspector is readily able to diagnose the condition and usually allows the bird to pass his inspection.

Adeno-carcinoma of the ovary has been frequently recorded in adult hens and the high incidence has been suggested as due to the abnormal demands made on the egg-laying ability of the fowl. Metastases are implanted throughout the peritoneal cavity, especially on the serosa covering the intestines. The latter are then seen to be firmly united to one another by firm, greyish tumours which involve the serous and muscular coats but do not usually penetrate the submucosa and mucosa. The firmness of these growths serves to differentiate them from visceral lesions of lymphomatosis and the diagnosis can be readily confirmed by histological examination.

Under "ovarian infection" are classed carcases showing yellowish-brown, firm, irregular ova, often lying free within the peritoneal cavity. The condition indicates that the bird was in all probability a "carrier" of *Salmonella pullorum*.

Cysts of the rudimentary right oviduct varied in diameter from 2 to 12 cm., and the largest weighed 480 gr. They contained a clear, almost colourless fluid in which were whitish flocculi, and were attached to a long thin pedicle which terminated blindly at the right side of the

cloaca. Large cysts resulted in ascites and anasarca, presumably due to pressure.

Among the neoplasms other than those of the oviduct were two cases of sarcomatosis of the voluntary muscles, one involving the pectoral muscles and the other the musculature of the leg.

In view of the superficial nature of the examination it was decided to group together cases of leukaemia (myeloid or lymphatic), lymphomatosis and fowl paralysis. Until the aetiology of these conditions and their relationship to one another is cleared up, it is, perhaps, as well to classify them together. Only three cases of macroscopic enlargement of the nerve plexuses were found, and these were confirmed histologically, when a typical infiltration of the nerves with lymphoid cells was seen. There were three birds affected with lymphomatosis of the ovary, and the remainder were affected with one or other type of leukaemia, mainly myeloid, associated with great enlargement of the liver and spleen. The incidence of leukaemia was much higher in birds from the United Kingdom.

The miscellaneous group included a broken leg, peritonitis, liver cirrhosis with ascites, and ruptured yolks within the peritoneal cavity.

Discussion

Since all poultry is cooked before consumption, the potential danger of transmission of disease to man is almost negligible. In the cases of tuberculosis, very few authenticated cases of human infection with tubercle bacilli of avian type have been described. The object of meat inspection, however, is to provide for consumption meat which is free from disease, and not merely "safe." If this object is to be attained, it is clear that a high proportion of birds of the "old hen" class are unsuitable for food and an adequate system of inspection is needed for their detection and confiscation. The need for a national system of inspection for poultry has been discussed by Grace (1938) in a paper read before the section of Veterinary Hygiene of the Health Congress of the Royal Sanitary Institute last year.* He has pointed out the unfortunate effect of a keener system of inspection in one market in diverting much of the trade to less desirable channels, permitting suspected carcases to evade inspection. In considering the public health aspect of the problem, he states (p. 441): "Surely the principle involved is whether the article examined is sound and free from disease, and that if it is not, failing surrender, it is the duty of the inspector to seize it."

Tuberculosis, which is practically always generalised in the fowl, should result in condemnation, especially in view of the widespread dissemination of the bacilli and their occurrence within most of the tissues, including, in a high proportion of cases, the bone marrow. With the exception of "fatty liver," the other disease conditions which we have encountered also render the carcase unsuitable for use as food. The method of inspection of fowl carcases—a small incision in the abdominal wall on the left side which is not visible when the bird is trussed—allows a suitable examination of the peritoneal cavity and the organs within it. The results of our examination of 250 fowls confiscated on a basis of such a system of inspection afford a clear indication of its effectiveness.

Photograph of carcase of plucked fowl showing incision made for inspection. Tuberculous lesions can be seen in the exposed area of liver.

Summary

An analysis is given of the causes of confiscation of 250 fowls of the "old hen" class, derived from consignments from the United Kingdom and Eire. In 145 birds, the cause of condemnation was tuberculosis and the distribution of the lesions in these cases is discussed. Palpation of the "neck glands," which in reality represent the thymus, is of little value in the detection of tuberculosis since lesions are found in this situation in only 20 per cent. of cases.

The condition known as "fatty liver" was found more commonly in birds from Eire. It is not in itself sufficient to warrant confiscation.

The other pathological conditions met with are briefly discussed and the need for a uniform system of inspection of fowls of the "old hen" class is stressed.

Acknowledgments.—We are indebted to Mr. Grace for supplying the fowls and the photograph and to Miss A. W. Greener, M.R.C.V.S., DIP. BACT., for assisting with some of the autopsies.

*Reproduced, following this article, in this issue.—*Editor.*

REFERENCES.

BARGER, E. H., and CARD, L. E. (1934.) Diseases and Parasites of Poultry. Kimpton, London.

BAYON, H. P. (1934.) Diseases of Poultry, *The Feathered World*. London.

BLOUNT, W. P. (——.) Poultry Ailments. *Poultry World*. London.

EBER, A. (1924.) *Zschr. infektKr. Haust.* **25.** 145-175 (Tuberculosis).

———. (1924-5.) *Ibid.* **27.** 1-19 (Tuberculosis).

EBER, A., and MALKE, E. (1932.) *Zschr. Krebsforsch.* **38.** 178-192 (Tumours).

EBER, A. (1934.) Die durch Obduktion festellbaren Geflügelkrankheiten. Schaper, Hannover.

GRACE, L. B. A. (1938.) *J. R. Sanit. Inst.* **59.** 436-456. (Meat Inspection).

VAN HEELSBERGEN. (1929.) Handbuch der Geflügelkeankheiten und der Geflügelzucht. Ferdinand Enke, Stuttgart.

KAUPP, B. F. (1929.) Poultry Diseases. Alexander Eger, Chicago.

REINHARDT, R. (1925.) Lehrbuch der Geflügelkrankheiten. Schaper, Hannover.

SEIFRIED, O. (1924.) *Arch. wiss. prakt. Tierheilk.* **51.** 425-437. (Lymph glands and thymus).

ZELLER, O. (1932.) *Ergeb. allg. Path. path. Anat.* **26.** 804-876. (Exhaustive article on tuberculosis with 433 refs.)

———. Some Diseases of Poultry. Ministry of Agriculture. Bulletin No. 6.

———. Diseases of Poultry, N.V.M.A.

THOUGHTS ON MEAT INSPECTION SUGGESTED BY SMITHFIELD EXPERIENCE

L. B. A. GRACE, M.R.C.V.S., D.V.S.M.,

VETERINARY OFFICER AND CHIEF MEAT INSPECTOR, SMITHFIELD MARKETS

When invited to read a paper on meat inspection to the Veterinary Hygiene section of this Congress, the difficulty which at once presented itself to me was the choice of a convenient aspect of the subject which would be acceptable for discussion. It had to be borne in mind that the usual or more orthodox problems, concerning methods of food inspection and legal requirements appertaining thereto, had been presented to, and discussed by, this and kindred organisations many times during recent years. Therefore, in an effort to avoid repetition and indulgence in mere platitudes, I selected the above title. In defence, it can only be said that Smithfield, drawing, as it does, supplies from nearly 30 countries throughout the world, exclusive of the British Isles, probably provides the truest pulse of the state of meat inspection throughout these countries, and at the same time affords unique opportunities for the exposition of certain problems. With the public health laws relating to food undergoing a process of assimilation, it is pleasant to feel that one can avoid criticism of them, and content oneself with the hope that when finally presented by the legislature it will only remain to congratulate the Ministry of Health upon a lucid and effective code which will simplify existing administration, and remove many sources of complexity and confusion.

As many will be aware, roughly 70 per cent. of the daily supplies at Smithfield Markets are of imported origin, the remaining 30 per cent. coming from all parts of the United Kingdom. During 1937 the total supplies handled at Smithfield were 469,917 tons. From an inspection point of view, imported and home-killed meat present their own particular problems. Apart from general remarks, it is not my intention to criticise or compare systems of inspection, and I desire merely to place before you such points as are compatible with, and suggested by, the title of this contribution.

The incidence of disease in imported meat is comparatively low, and this happy state of affairs is due no doubt to several factors, the chief being: (*a*) well-organised systems of inspection in the exporting countries; (*b*) a lower incidence, at least of the commoner diseases of livestock, in the exporting countries than in our own—a striking example of this is tuberculosis—and (*c*) lastly, but by no means least, our own check inspection of imported food which has, in my opinion, done more than anything else to raise and maintain at a high level the standard of inspection in exporting countries. Proof of this is at hand in recent years in connection with caseous lymphadenitis, of which it is now exceptional to obtain a gross lesion in imported carcases. It is unfortunate that greater uniformity in methods and extent of inspection does not exist at points of entry of imported meat into Britain. In fact, the only generally recognised *modus operandi* refers to the inspection of mutton and lamb carcases exceeding forty-two pounds in weight, in which a 5 per cent. examination is carried out, chiefly for the detection of caseous lymphadenitis. In this instance, carcases are partially defrosted, and after removal of wrappers internal and external surfaces are examined, this being followed by incision of superficial inguinal or supramammary, precrural and prescapular lymphatic glands on each side. Portions of carcases are submitted to 100 per cent. examination, all available lymphatic glands being incised.

IMPORTED BONELESS BEEF AND BONELESS BOBBY VEAL

Rapidly increasing quantities of these articles are finding their way to Britain and present an inspection problem worthy of discussion. I have already expressed the opinion that the standard

*Paper presented to the Health Congress of the Royal Sanitary Institute (Section D—Veterinary Hygiene), at Portsmouth, on July 14th, 1938. Reproduced from the *Journal of the Royal Sanitary Institute*. 59. 6. 436-443.

of inspection in the exporting countries is largely influenced by the system of check inspection in this country. In these boned-out articles we have an almost uninspectionable commodity, since most of the tissues valued by the inspector for diagnostic purposes have been removed in the boning operations. If examination of imported meat be necessary, and I think there can be little doubt that it is essential, meat inspectors must have examinable pieces submitted to them. At the present time, therefore, increasingly large quantities of boneless meat are passing into our ports without the slightest possibility of being subjected to adequate examination. Much of the beef admitted is cow and bull beef of extremely poor quality, and in some cases obviously a mere by-product of the dairying industry in various parts of the world. I have a high regard for the system of official certification applied to imported beef, but imperfections of human nature, and practical findings in the practice of meat inspection both at the exporting and importing ends, deny me the comfort of placing complete confidence in it. There can be no better device for removing evidence of disease and unsoundness than the boning-out process. Apart from co-existing disease, one cannot confiscate or recommend condemnation of meat for mere poorness of quality, but the thought constantly occurs to me, when inspecting defrosted boneless beef, that one's judgment might be altered, and certainly materially assisted, were the bone present. It is not difficult to envisage such meat as belonging in many cases to wet, emaciated carcases conjuring up the perfect picture of an animal affected with Johne's disease in the advanced state. I desire to avoid as far as possible prolonged reference to the Imported Food Regulations, but while considering the problem of boneless beef it may be as well to point out to inspecting authorities that the proper execution of these regulations demands the defrosting of large quantities of this class of meat in order to determine whether or not it is prohibited meat within the meaning of paragraphs (*a*) and (*b*) of the first schedule of the Public Health (Imported Food) Regulations, 1937.

With reference to imported boneless veal, the question of immaturity arises. Despite excellent criteria set out in Memo. 62/Foods for our guidance, the term defies accurate definition. This fact apparently deters most inspecting authorities from dealing with the problem. The inequitable sequel to this position is that whereas large quantities of home-killed veal are constantly seized or surrendered as being immature, and hence presumably unfit for human consumption, boneless bobby veal of imported origin, and equally immature, finds an unobstructed path to the consumer. In dealing with the matter, I have been assured by representatives of exporting countries that certain export standards have been prescribed, including minimum weight standards. It will be obvious at once that any weight standard depends largely upon the breed of calf producing the veal, and that a calf from, say, a Jersey or Kerry cow, will be at an equal age much lighter and smaller than one from a Friesian or Shorthorn cow. However, I do suggest that for purposes of examination of imported boneless veal the weight standard may be taken advantage of as a guide to the necessity or otherwise of defrosting with a view to adjudging the possibility of immaturity. For example, supposing a country lays down, among other criteria, that a side of boned veal must not fall below a minimum weight of eleven pounds, or ten pounds for a small dairy breed type, it would be reasonable for an inspector to request the defrosting of parcels where he finds the weights do not attain this minimum standard. Acting on these lines I have found good grounds for defrosting, examining, and, as a result, confiscating, imported veal from time to time on the score of immaturity. By way of control and experiment, it was interesting to obtain an almost full-term stillborn calf giving a dressed carcase weight of 40 pounds, and which was subsequently boned by an expert boner. This carcase rendered a boned-out weight of 27 pounds, *i.e.*, 13½ pounds per side. The sides were then frozen, and afterwards defrosted for the purpose of comparison with imported veal which had been confiscated on grounds of immaturity. In my judgment, the veal of the stillborn calf compared favourably with the imported, and indicated that much lamentably low-standard immature veal of imported origin is passing into consumption with ridiculous ease and under practically no supervision. Several practical and experienced meat inspectors who viewed this experiment concurred in my opinion.

Taints in Meat

I am prompted to mention this subject because in recent years large losses have been entailed in this connection with reference to imported meat, and the loss over a two-year period has been reliably computed at £50,000.

Meat has a certain affinity for the absorption of odours of various kinds, including, among others, those from oil, smoke, fruit, etc. Probably the chief wastage is that caused by citrous fruits, most commonly oranges. It is a common practice to carry mixed cargoes of fruit and chilled and frozen beef, particularly from South American countries. The use of ozone in fruit spaces has usually been effective in counteracting or destroying the normal quantity of gas given off by sound cargoes of fruit. But where over-ripe or unsound fruit has been stored, there results an excessive

generation of gases, with subsequent filtration to the accompanying meat cargo and resultant tainting of the meat. While further ozonisation of such meat may be effective or partially effective in removing the taint, it should be borne in mind that excessive ozonisation is likely to render meat unpalatable through imparting a metallic taste and creating a greater liability to rancidity. Although undoubtedly the matter is a serious commercial problem, it is my opinion that, from a public health aspect, fruit-tainted meat cannot be condemned as unsound. With regard to other tainting agents, judgment must be influenced by the nature of the agent; for example, where fuel oil is the damaging substance the meat is certainly rendered unsound. It may sometimes happen that a cargo or parcel is presented for judgment with a history but no physical evidence of oil or smoke damage in transit. If difficulty or doubt arises in discerning the odour, the only reliable guide is to cook and taste a sample of the suspected article.

Poultry Carcase Inspection

The inspection of poultry carcases has become a matter of grave concern on the London markets. Handling, as we do, huge supplies from all parts of the country, and knowing that the incidence of disease in poultry is extremely high, it has been our endeavour recently to institute some organised system of inspection. Following upon our own efforts, came the report of the Poultry Technical Committee of Great Britain, confirming the need for our intensive system of inspection which, by results, had already justified itself. I have no desire to sensationalise this part of my paper, but if its discussion will result in the initiation of a national system of inspection, at least for poultry, our time will have been well spent.

The position with regard to incidence of disease and the mortality rate in poultry is well portrayed in the report already referred to. The National Veterinary Medical Association has estimated the loss from disease to be over £4,000,000 per annum for adult laying birds in England and Wales. If potential losses due to confiscation of diseased poultry carcases under public health regulations, when properly executed, be added to this, the estimate would expand considerably. However, thereby hangs the tale of our extremely flexible system of meat inspection, speaking with regard to England and Wales generally. The immediate effect of our keener inspection of a certain class of table poultry, namely, "old hen" carcases, apparently has been to divert much of the trade into less desirable channels, deprive reputable poultry dealers in the London markets of the opportunity of handling such supplies, and permit suspected articles completely to evade inspection. This is surely an extremely undesirable state of affairs.

Bearing in mind that public health legislation places the onus for trading in diseased or unsound food for human consumption upon the owner, and the person in whose possession or on whose premises it was found, and realising the impossibility of inspection of each individual carcase by an inspector, it was essential to take advantage of these liabilities placed upon the persons concerned by the legislature. Salesmen on the markets, therefore, were asked to incise all fowls of the "old hen" class. Results were astonishing. The livers were exposed, and in this selected class of fowl, disease was found to exist in many consignments in well over 50 per cent. of the carcases examined.

A fair indication of the result of this type of examination is represented by a comparison of numbers of poultry carcases confiscated because of disease during similar periods in different years. The 1937 period represents a time when inspection methods relied, as had been the practice for many years, upon occasional incision of suspected carcases. In the second period practically 100 per cent. incision of the "old hen" class of carcase was carried out.

The numbers of carcases of poultry "condemned" were as follows:—

March, 1937	947
March, 1938	2,985
Increase	2,038

It must be borne in mind that disease is not confined to poor or emaciated birds. It is found in fat, perfectly finished birds, and the important factor governing or indicating necessity for incision is age. Hens may, I think, be classified arbitrarily as old for this purpose, from 12 to 15 months upwards. Let no one be misled into thinking that he or anyone else, however experienced, can, with this class of poultry, pick out carcases in which he knows he is likely to find disease, or, alternatively, that he can with any degree of certainty indicate carcases which will be found free from disease.

So far, poultry carcases, in comparison with beef, pork and mutton, have maintained a high degree of immunity to interference from the inspector's knife. In actual fact no serious attempt at poultry-carcase inspection seems ever to have been made. That the incidence of disease presents more appalling figures than in any other species is undoubtedly true. Thus we are faced with the problem as to the advisability of initiating a satisfactory system of poultry-carcase inspection or deciding that the position does not warrant this. If the latter be true, it would seem to indicate that our efforts to procure a disease-free food supply in other species are equally worthless. I approach the problem

in this manner because it has been seriously suggested to me by responsible authorities that the disease position in poultry (tuberculosis being accepted as chief cause for confiscation), is of little importance from a public health aspect, because, firstly, the avian tubercle bacillus is probably non-pathogenic for man, and, secondly, even if it is pathogenic for man, the carcase is thoroughly sterilised in the boiling or cooking process. Both points may be considered together. Tuberculosis in fowls is caused generally by the avian type of the tubercle bacillus, and occasionally by the bovine, or even the human, type of the bacillus. It matters not whether the avian type is pathogenic to man, although there seems from authoritative references good grounds for saying that it has proved pathogenic in the human subject. It must reasonably be accepted that in the ordinary course, consumption of tuberculous carcases is extremely unlikely to transmit the disease to man. However, from the meat inspector's point of view, is this of such practical importance? Surely the principle involved is whether the article examined is sound and free from disease, and that if it is not, failing surrender, it is the duty of the inspector to seize it. The public, speaking through the legislature, do not say, "Prevent us from eating food which, if diseased or unsound, will transmit that disease or unsoundness to us." Impliedly, they say, "We do not desire to eat unsound or diseased food." In my judgment, therefore, nothing short of thorough inspection and confiscation of diseased or unsound carcases can satisfy. Appreciating that the medical officer of health must possess the ultimate responsibility for deciding what is unfit for human consumption, and realising the considerable realm of human ailments the aetiology of which is so far unsolved, it is difficult to imagine any medical officer of health, or other medical expert, enunciating, with conviction, any other principle. There is, of course, the purely aesthetic side of the problem, with which it is unnecessary to deal. Actually any modification of the system of confiscation for disease or unsoundness would be an acknowledgment of a modified "freibank" system without, at present, any legislative authority, and certainly without the safeguards which that system, as operated in Germany, affords. Certain difficulties arise in connection with poultry inspection which it is impossible to discuss at length in a paper of this kind. However, an important point of difficulty which should be borne in mind by inspectors is that of differential diagnosis. The liver is usually the first organ referred to for a diagnosis of tuberculosis, but in a small percentage of cases, liver lesions resembling tuberculous foci present themselves, which may in reality be focal cellular infiltrations due to leukaemia. This condition is frequently accompanied by enlargement of the spleen and kidneys. If it be accepted that this condition is due to a filterable virus, as has been suggested by several workers, accuracy of diagnosis probably makes little difference so far as the ultimate judgment of the carcase is concerned. Examination of the other organs will usually suffice to differentiate this condition. The incidence of tuberculous lesions in the various organs of an affected carcase is worthy of note as an aid to judgment and diagnosis, and is probably fairly accurately stated in Vosgien's statistics on 145 cases, published in Hutyra and Marek, as follows:—

Liver	98·6	per cent.
Spleen	93·1	„ „
Lymph glands	70·3	„ „
Lungs	42·1	„ „
Bones and joints ...	22·8	„ „
Gastro-intestinal canal ...	20·1	„ „
Peritoneum	9·0	„ „
Kidneys	6·2	„ „
Ovaries	4·1	„ „

The frequent necessity for examination of the various organs leads to the obvious conclusion that the most suitable time for inspection of poultry carcases is at the place where they are drawn or cleaned in the ordinary process of marketing. However, it is outside the scope of this paper, at this late stage, to discuss ways and means of attaining such an objective.

Uniformity of Inspection

A few general remarks which may be aptly applied to the various problems considered will serve to conclude.

A serious attempt must be made to obtain some degree of uniformity in meat and food inspection practice throughout the country. Whether this be effected by a national system of meat and food inspection under the jurisdiction of a central body or by a general application, within the jurisdiction of local authorities, of sound systems already practised by a minority of authorities, is apparently debatable. The better opinion would probably favour the former method, but if the latter be adhered to, as being less revolutionary, it would seem essential to group many of the smaller local authorities for the purpose. At least it will be generally accepted that in fairness to public and traders alike there is an urgent necessity for a system which will eliminate once and for all the many inequalities of treatment emanating from our present lack of system. Also the invidious position would thus be ended whereby local authorities, diligently executing their various duties under public health food legislation, are threatened with a migration of trade to less well inspected areas.

The Veterinary Record

April 15th, 1939.

The National Veterinary Medical Association and The People's Dispensary for Sick Animals of the Poor

MANY of our readers have written enquiring to what extent the National Veterinary Medical Association has participated in the negotiations which have taken place recently between the People's Dispensary for Sick Animals of the Poor and this profession. The present editorial has been written with a view to giving our readers an objective summary of the limited part which the "National" has so far had the opportunity of playing in this matter.

On February 13th the President of the "National" visited the Royal College of Veterinary Surgeons to discuss informally certain matters of common interest to the two bodies. It was at this meeting that Mr. DeVine first heard of the scheme arranged between the R.C.V.S. and the P.D.S.A. Upon being asked whether the "National" would support the scheme, the President replied that he could give no assurance at once to that effect but he would bring the matter urgently before the Association's Executive Committee, to see whether a special Council meeting should be called to decide the Association's course of action.

This Committee met on February 21st and had the advantage of the presence of Mr. Bridges Webb for a portion of its discussions. The chief reaction of the Committee was one of astonishment that the scheme had progressed so far without the "National" being informed. The discussion was free and frank and was concerned mainly with the four basic points of the agreement. It was resolved that the matter be referred to the appropriate committee, *viz.*, the Organising Committee, for thorough examination, this committee to be summoned for March 6th. Meanwhile it was agreed that every effort should be made to persuade the R.C.V.S. and the P.D.S.A. to postpone their announcement so that the news of the rapprochement would not come as such a surprise to the profession.

Before the meeting of the Organising Committee, the President-Elect and the Hon. Secretary of the "National" each had lengthy informal discussions with the President and Registrar of the Royal College with a view to delaying the despatch of the letter from the Royal College for a short time: unfortunately the special sub-committee of the R.C.V.S., which met subsequently, was unable to accede to this request. On Sunday, March 5th, at the request of the General Purposes Committee of the Association, Professor Mitchell, Mr. Steele Bodger and the Hon. Secretary discussed at length with Mr. Bridges Webb the possible development of the scheme in practice and many of the difficulties that might be expected to arise.

The Organising Committee met on March 6th and discussed the matter very thoroughly in the light of all information available, this including on this occasion the actual terms of the letter to be sent out by the President of the R.C.V.S. Mr. Bridges Webb again kindly attended for part of the meeting. At this meeting, in answer to a question put by the Chairman, Mr. Wright, "What is it the P.D.S.A. expect of the 'National'?", Mr. Bridges Webb answered, "Co-operation and practical advice as to how we can make the scheme a success and help to frame an agreement upon such a basis as will be of mutual advantage." At the conclusion of this meeting, the Committee resolved to continue their enquiries in as thorough a manner as possible.

On April 3rd the Organising Committee met again and decided, after further consideration, to recommend to Council the appointment of a small sub-committee to try to evolve a satisfactory scheme for collaboration in practice with the P.D.S.A., the scheme not to be at variance, in main principles, from that agreed with the R.S.P.C.A.

The meeting of Council, N.V.M.A., on the following day, passed a resolution in the following terms: "That an endeavour be made to form a Joint Committee consisting of representatives of the Royal College of Veterinary Surgeons and the National Veterinary Medical Association to evolve a scheme whereby an agreement may be made with the People's Dispensary for Sick Animals of the Poor that will be acceptable to the profession."

(*Concluded at foot of column* 1, *page* 483)

CLINICAL COMMUNICATION

Aujeszky's Disease

("Pseudo Rabies," "Infectious Bulbar Paralysis," "Mad Itch.")

A PRELIMINARY NOTE

H. G. LAMONT and W. R. KERR

The purpose of this note is to confirm the existence of this disease in Northern Ireland.

History of Outbreak.—The Veterinary Research Division was consulted about three unusual cases in young bovines by Mr. David McKelvey, M.R.C.V.S., D.V.S.M., Lisburn.

The following brief history was obtained.

No. 1 animal was about eight or nine months old. Apparently it had been rubbing its head against the shed door with such vigour during the night that it had burst the door open. The owner described it as having "battered the hair and the skin off its head." It died within two hours of being seen in the morning and could not have been affected longer than 12 hours as it had appeared all right at bed-time.

No. 2 animal was observed to be affected on the evening of the following day. It had very intense head itch and literally battered the hair and skin off its face. It died 6½ hours after its condition was noticed.

No. 3 animal was noticed dull the same afternoon. Mr. McKelvey was called in to see it. It had trouble in rising and was trembling violently. An itchy patch about 18 in. in diameter developed on the left side of the body and this animal, again, literally tore the hair, skin and flesh off itself. It died in about 24 hours from being first noticed.

Animals No. 2 and 3 were yearling stores. Animal No. 1 was in a shed with ten other animals. They were kept housed.

Animals No. 2 and 3 were housed with nine others but had access to pasture during the day time. In addition to hay and water the animals were fed bran, yellow meal, a flaked maize, and bruised oats in equal parts. 28 lb. of this mixture was given to eleven animals.

Animals No. 1 and 2 were brought to the laboratory for *post-mortem* examination. Animal No. 3, unfortunately, was removed to the knackery and destroyed.

The history of animal No. 3 was not available when the first two were brought to the laboratory for *post-mortem* examination and until the carcases of animals No. 1 and 2 were seen the presence of Aujeszky's disease was not suspected.

Post-mortem Examination. — The extensive head injuries were at once apparent. The hair, skin and flesh were literally rubbed off the anterior aspect of the head. Decomposition had set in very quickly despite the cold weather. Areas of inflammation were present in the abomasum and the mucous membrane in the centre of these areas was slightly ulcerated. Nothing else was noticed beyond extensive decomposition.

Biological Tests.—Emulsions were prepared from the brain substance and medulla and one rabbit was inoculated from each case. No. 1 rabbit was noticed nibbling at its leg at the site of inoculation late on the evening of the second day (Wednesday evening to Friday evening). On the morning of the third day (Saturday) it was tearing its leg badly and becoming very weak. It died within one hour. No. 2 rabbit was noticed nibbling at its leg on Saturday morning. It became comatose very quickly and died in two hours. A third rabbit was inoculated from the brain substance of these two rabbits. The fourth day following inoculation it was attacking the site of inoculation very savagely and had its leg very badly lacerated. It was destroyed for humanitarian reasons. Further work will be undertaken in an attempt to follow up the source of infection.

A most informative article on this disease by Dr. Ian A. Galloway was published in the *Veterinary Record* of June 18th, 1938 (No. 25, Vol. 50).

We understand from Dr. Galloway that this is the first occasion that the presence of Aujeszky's disease has been confirmed in the British Isles.

It is sincerely hoped that this joint committee will be formed and that after consideration of the many difficulties which it has been suggested, both in Committee and by correspondence in this journal, are likely to arise as co-operation between the profession and the P.D.S.A. extends, it will be in a position to recommend a scheme acceptable to the veterinary practitioner. Meanwhile, we would remind our readers that one of the senior representatives of the P.D.S.A. is calling upon members of the profession to discuss joint problems. We think it desirable, pending the formation of the proposed joint committee, that our members refrain from committing themselves too deeply with the People's Dispensary, so that we may ensure uniform collaboration between the profession and this important Animal Welfare Society.

At a meeting of the Merioneth Diseases of Animals Committee at Dolgelley it was reported by the Chief Constable that there were 450,000 sheep in the county, which was in the happy position of being free of sheep scab.

ABSTRACTS

[Notes on Veterinary Surgery. (Trans. title.) Punin, S. (1938.) *Berl. tierärztl. Wschr.* **43.** 656-657.]

I.—Neurectomy of N. peroneus profundus. It is easier to find the common border line of the long and lateral digital extensor muscles if the skin incision is made horizontally (across the line of the limb), instead of vertically, as commonly taught.

II.—Roaring operation. (*a*) Punin has had nearly 100 per cent. cures by performing tracheotomy before ventricle stripping. He says that the larynx must be at rest for the healing and immobilisation of the vocal cords to take place; this is not obtained if the horse has to breathe through its larynx during the healing period. The tube used is of only 2 cm. diameter and is left in until the seventh or tenth day after operation. (*b*) Punin advises severance of the cricoid cartilage immediately prior to slitting the crico-thyroid ligament, as by so doing the severed cartilage gapes open about 1 cm. and affords a wider field of view.

[Both these suggested procedures are looked upon with disfavour by the principal operators in this country, not only as being unnecessary, but from the possibility of their leading to harmful results.—Editor.]

III.—Treatment of Traumatic Luxation of the Patella. Reluxation after reposition can be prevented if the limb is kept flexed. To do this a wedge of wood is attached by iron strips to the shoe so that the heel is raised 5 or 6 cm. Duration of attachment four to five days.

IV.—Prevention of Neuroma after Neurectomy. Dissect free the neurilemma and sever it a short distance below the level of neurotomy, retract it upwards while the nerve is cut and then pull it down and ligature it, at the same time fastening some adipose tissue over the nerve end. If there is no fat there, some may be transplanted (thither) from the subcutis of the neck or other part.

J. E.

* * * * *

[The Curability of Sagittal Fractures of the Pedal Bone in the Horse. (Trans. title.) Meierjurgen (1937.) *Zschr. Veterinärk.* **49.** 11. 369-379.]

An excellent and fully documented review of pedal bone fractures in horses, with an account of two cases which recovered. One was in the off hind foot and the other in the near fore foot.*

*It is not stated whether the fractures extended into the joint surface or not; nor is it clear, as the X-ray pictures are very poor.—*Abstractor.*

The treatment applied was that of Professor Bolz, of Giessen Veterinary School. It is directed to the prevention of movements of the parts which take place every time the horse bears weight on the foot (hoof expansion). Extra nails are inserted through the shoe towards the heels on each side to immobilise the hoof; the coffin joint is immobilised by a plaster of Paris bandage extending above the fetlock and the horse is placed on soft straw in a loose box.

One case healed in six weeks and the other in ten.

J. E.

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[I.—New Investigations on the Physiology of the Fore-Stomachs of Ruminants. (Webster, J.); **II.—The Enzyme Activity of Ruminal Contents.** (Sym, E. A.) (1938.) Thirteenth Int. Vet. Cong.]

I.—Using the rumen fistula method, the following results were obtained in the cow: The rhythmic contractions of the reticulum as well as the peristaltic and antiperistaltic movements of the omasum and rumen were recorded. it was noted that rumination as well as regurgitation could be initiated when the first stomachs were at rest, and further could take place independently of abdominal pressure. Regurgitation began simultaneously with the antiperistaltic wave in the rumen. In very young calves the groove closes when any kind of liquid is taken. The reflex is elicited by stimulation of the pharynx. In older calves this groove does not close when they drink water; with age the response even to milk disappears—certain chemical substances, however, remain effective. It appears, therefore, that the function of the oesophageal groove is the carrying of small quantities of food to the omasum at each contraction of the reticulum.

In so far as the results obtained in small ruminants differ from those obtained in the cow, it may be that the disparity is one of differences in technique.

The author believes that the antiperistaltic movement of the oesophagus is the primary factor in rumination and that the reduction of the inter-thoracic pressure on inspiration is only a contributory cause.

II.—The author has studied the proteolytic, amylolytic and the lipolytic action of different parts of the contents of the rumen in cattle (plant remnants, starined liquid, centrifugate and ultrafiltrate). With the aid of methods adapted according to the material examined, it was possible to determine in the filtered stomach liquid a very weak amylolytic and proteolytic action; this action is relatively much stronger in the solid part of the rumen

content. No lipase could be detected in the ultrafiltrate in this state. This ferment is similarly combined with the solid elements of the stomach contents.

J. Y. B.

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[Creosote Poisoning of Cattle. Hanlon, G. (1938.) *Austral. Vet. J.* **14**, 2. 73 (One ref.)]

The sudden death of four steers and two cows from a herd of 94 head of cattle which had access to crude creosote, is recorded.

The symptoms shown by the affected animals included great thirst, acute colic, dyspnoea, blistering and induration of the buccal mucosa, contraction of the pupils, blackening of the faeces, and finally collapse and coma.

Autopsy revealed a black oily liquid in the abomasum, and throughout the whole length of the bowel.

It is concluded that the creosote was ingested from poles which had been treated, and left on the ground before erection.

D. D. O.

* * * * *

[Insects in Relation to Disease of Domesticated Animals. Sen, S. K. (1938.) Agriculture and Livestock in India. **8**, pt. 3. 235-244.]

In this popular article, which is one of a series designed for practical farmers in India on various animal husbandry subjects of general interest, Sen deals with the commoner diseases of livestock which are known or suspected to be transmitted by insects, pointing out that transmission may be either purely mechanical or cyclical, in which case the causal organism of the disease undergoes certain developmental changes in the insect. Amongst the more important pathogenic diseases which are insect-borne, the author mentions rinderpest, presumed to be spread by blood-sucking flies; fowl-pox, spread by mosquitoes and the stable fly; anthrax, transmitted by various flies; haemorrhagic septicaemia, with biting flies, notably horse flies, and fleas as presumed vectors; surra, by several species of horse flies; pigeon malaria, caused by *Haemoproteus columbae*, with cyclical development in *Pseudolynchia maura*; bursati, caused by the nematode *Habronema* and spread by flies; taeniasis, caused by *Diplidium caninum* and spread by fleas and the biting louse of the dog. In a concluding section on combating disease-carrying insects the author stresses that any rational method of control must be based on an adequate knowledge of the insects' life-histories.

J. N. O.

N.V.M.A. DIVISIONAL REPORT

Lancashire Veterinary Association*

ANNUAL MEETING AT LIVERPOOL

The Annual General Meeting of the Lancashire Veterinary Association was held at the Department of Veterinary Pathology, University of Liverpool, on the afternoon of Wednesday, February 1st, 1939.

Mr. G. Mayall occupied the Chair, and there were also present: Mr. F. A. Ball, Professor J. F. Craig, Mr. N. M. Clayton, Dr. G. O. Davies, Messrs. H. R. Hewetson, J. Holroyd, R. B. Hornby (student member), A. H. Leyland, P. T. Lindsay, R. C. Locke, A. B. Mattinson, A. L. Mullen, E. A. Pearce, E. W. Prescott, E. P. Shallcross, C. F. Shawcross, C. T. Trevers, W. Walker, G. C. Webster, J. H. White, W. Woods and A. J. Wright. Messrs. W. H. France, R. S. Roberts and Miss P. Stubbs were present as visitors.

Apologies for absence were received from Messrs. R. N. Clunie, R. L. Greenhalgh, H. G. Hewetson, Sir F. Hobday, Messrs. H. Holroyd, Sen., H. Holroyd, Jun., R. Hughes, G. H. Locke, J. F. D. Tutt, R. S. White and J. H. Wright.

The minutes of the last Annual General Meeting having been published, it was proposed, seconded and carried unanimously that they be approved and signed.

Correspondence.—The Secretary read the following correspondence:—

(*i*) From Mr. J. Lyon, who had left the district, submitting his resignation.

The resignation was accepted with regret.

(ii) From the N.V.M.A., referring to broadcasts by the B.B.C. on the care of animals by unqualified persons.

Mr. H. R. Raynor Hewetson told the meeting of correspondence he had had with Mr. Knight on this subject and on the proposal of Mr. Hewetson, seconded by Mr. Webster, it was resolved that the Secretary be instructed to write to the B.B.C. protesting against these broadcasts on the grounds that (*a*) it was not in the public interest that talks should be given which purported to be authoritative but were in fact not given by a person qualified to do so, (*b*) that these talks were not in the interest of animals since they tended to support home doctoring, which may involve them in unnecessary suffering, and (*c*) that they constitute a slight on the veterinary profession, who, being willing to give authoritative talks on this subject, were passed over in favour of unqualified men. It was also resolved that

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the Secretary write to the Secretary of the N.V.M.A. and the Registrar of the R.C.V.S., informing them of the action taken.

Nomination for Membership.—Following on the correspondence, Professor Craig nominated Mr. Roberts, of Runcorn, for membership of the Association.

Hon. Secretary's Report.—The Hon. Secretary read his report and on the proposition of Mr. Hewetson, seconded by Dr. Davies, the report was adopted.

Balance Sheet, etc.—The Honorary Treasurer presented the Balance Sheet, which was adopted on the proposition of Professor Craig, seconded by Mr. Woods.

Election of Officers and Council

The President reported that the Council had recommended Dr. Davies as President for the ensuing year. On the proposition of Mr. Hewetson, seconded by Mr. Woods, Dr. Davies' election was carried with acclamation.

Other elections were as follows:—

Vice Presidents.—Mr. G. Mayall and Mr. H. Raynor Hewetson.

Hon. Secretary.—Mr. J. C. Baird.

Hon. Treasurer.—Mr. R. C. Locke.

Hon. Auditors.—Mr. J. H. White and Mr. T. A. Dobie.

Council.—To hold office for three years: Professor J. F. Craig, Messrs. J. Holroyd, T. G. Millington, H. Sumner and A. J. Wright.

To hold office for two years: Major A. B. Mattinson and Mr. R. H. Oddy.

After discussion it was proposed by Professor Craig, seconded by Major Mattinson, and agreed that election of representatives for the Council of the N.V.M.A. be deferred to the next Council meeting.

Induction of President

The retiring President, Mr. Mayall, then addressed the meeting as follows: "The time has come for me to vacate the Presidential Chair. The experience has been an interesting and pleasant one and I must thank Mr. Baird and Mr. Locke for the help they have given me and the members for the satisfactory way in which the meetings have been attended. One thing that has happened during my Presidency has been the issue of the Loveday Report. A statement that has riled me more than any is the reference to our profession as being affected with an 'inferiority complex.' Personally, I think the inferiority complex rests with those who neither understand nor appreciate the worth of our profession. It is quite true that we do not give three hearty cheers for ourselves every time we see our faces in the glass, but we are none the worse for that, and leave such self-praise to those with 'the superiority complex.'

"Your Council has prevailed on Dr. Davies to be the next occupant of the Presidential Chair. He needs no introduction to you. He is always genial and approachable, and many Lancashire and Cheshire practitioners are indebted to him for expert help and advice. We also have the satisfaction that in him this Association will be quite modern and up to date, for is he not a veterinarian and University man who knows all about us and understands our trials and triumphs?"

Dr. Davies, having been conducted to the Presidential Chair, then said: "May I, first of all, express my keen appreciation of the confidence which you have placed in me to-day by electing me as your President for the coming year. It is, however, with some diffidence that I accept office as I doubt very much whether such an office falls within the range of my talent. I am reminded of an epigram which I read some time ago. It ran something like this, 'Trim your ambitions according to your talents, but do not force your talents to suit your ambitions.' Hence my diffidence.

"In accepting this office, I am also conscious that I am not alone in receiving recognition. It is also a recognition, or at least I interpret it as such, of the efforts, on behalf of this Association in particular and the profession as a whole, made by the department of the University in which I have the pleasure of working. I am delighted to think that I am the first full-time member of the University staff to occupy the Chair and I sincerely hope and trust that this is a happy augury for the future when the 'Lancashire' and the University will become even more closely knitted together.

"I am particularly grateful to you, Mr. Mayall, for your kind and eulogistic references but I doubt very much whether I am worthy of them. However, as I am only at the commencement of my year of office I think we will let that matter lie on the table and that will leave you free to give your verdict in twelve months' time.

"Before I proceed with any other business I should like to take this opportunity of expressing on your behalf to Mr. Mayall our keen appreciation of his services to the Association, particularly as our President during the past year. I think we can look back upon last year as one of our best years. We had some very interesting and instructive meetings and a particularly enjoyable summer meeting. We have also had our problems to face and decide both at general and council meetings and I feel that we are greatly indebted to Mr. Mayall for 'steering' us through so skilfully.

"I should like to move that we record our grateful thanks to Mr. Mayall for his loyal and valued services."

This was carried with acclamation.

Professor Craig proposed a "Vote of thanks to other Officers for their services in the past year, and that the best wishes of this Association be accorded to the Executive Officers for the work that they had done during the past year." "We are all grateful to them," said Professor Craig. "We know that some of them are constantly engaged in the services of the Association. With regard to the Treasurer and Secretary, I think we are well served with Mr. Baird as Secretary, and as for the Treasurer, one need only refer to the Balance Sheet of the Association to see how well he had done his work."

Mr. Baird and Mr. Locke replied, thanking the meeting for the kind way they had accepted Professor Craig's resolution.

Presidential Address

Dr. Davies then gave the following Presidential Address:—

I see from the agenda, although it does not require an agenda to remind me, that it is now up to me to deliver what you as members have to tolerate each year, namely, a Presidential address. This, despite the suggestion made at the Council meeting when I was hesitating to accept office, that such an address was quite unnecessary.

It has been and is the practice at meetings of Divisional Associations for incoming Presidents to "ruminate" on the past, present and future. One can speak at great length on the things of "yesterday," but I doubt its value. It is the present and future that matter and for all practical purposes these are one.

Our main preoccupation at present is the future of the profession. It is now being shaped and moulded and it is our duty to look upon the major subjects which are being considered not through our own eyes, but with the eyes of those who follow, for it is they who will benefit or suffer most from any unwise or precipitate action which may be taken "to-day." We have long been crying out for a greater appreciation of our professional activities and we have proclaimed that full advantage is not being made of us in spheres where we are best qualified to serve. The outcome of this is—

(1) The recently inaugurated Veterinary Service.
(2) The Report of the Committee on Veterinary Education in Great Britain—popularly known as the "Loveday Report."
(3) The Report of the Poultry Committee of Great Britain.

The State Veterinary Service, as you know, was launched more or less as a *fait accompli*. In principle, it was what many had realised had to come sooner or later. In detail, however, it was not all that could be desired, but thanks to the efforts of the Consultative Committee of the N.V.M.A. and the desire, although perhaps apparently belated, of the Ministry for co-operation with the profession, a much more attractive scheme has been evolved. It is still not by any means perfect but one has to bear in mind that a scheme of such magnitude can only be perfected by experience. There are some who have already derived considerable benefit from it, others who deride it mercilessly—that is inevitable. Has any perfect scheme or report yet been put forward?

There is one point, however, which stands out prominently from all this, and that is that such changes and improvements as have been made have arisen from the interest and activity of our parent association. Where would we have been without the N.V.M.A. and its Consultative Committee? I put it to you that, strong as its influence has been in the past, and excellent as have been the results, who knows but what we practitioners and others may be even more dependent on its strength and influence in the future? Let us strengthen the N.V.M.A. still further. There is no doubt that a national association, with a large membership and with wide representation on its council and committees, which is wisely guided, can be of inestimable service to the profession. I should like to see, in my year of office, all members of the "Lancashire" members of the "National." It is no use criticising the N.V.M.A. from without—that never does any good. Become active members of it and "right the wrongs" from within. The same remark applies to members of the profession in Lancashire and Cheshire in relation to our Divisional Association.

I am afraid I have digressed somewhat from the subject of the State Veterinary Service but I think the "moral" requires emphasis. I do not propose to enlarge any further on this subject as most of you present this afternoon probably know more about its "working" than I do as an interested onlooker. My sincere hope is, however, that the scheme will eventually work out to the lasting benefit of the profession.

The second important happening is the publication of the Report of the Committee on Veterinary Education, or the Loveday Report. I do not propose to enter into a detailed criticism of the report, for two reasons: the first, the important one of lack of time, and the second, that it is much too important a document to be treated cursorily in the course of an address such as this. I do, however, implore you to read this publication for yourselves. Don't swallow other people's views or editorials whole. The report requires very careful "digestion" for it to be assimilated and appreciated in all its aspects. Please do not

think because you are not intimately concerned with educational matters that it does not concern you. It has a very important bearing on our professional future. If it is implemented by the Government, veterinary education of the future will undergo very radical changes.

In order to try and convince you on this point may I refer very briefly to some questions which are raised?

First of all I should say that many of the conclusions and recommendations cannot but claim our unanimous support. There are others which call for serious consideration in so far as they make for almost complete demolition of portions of the "edifice" in which professional instruction has been given for generations. That is not to say that many of our methods, systems, etc., may not be obsolete, unsatisfactory and not conducive to the best that can be obtained. But we must be on our guard lest we, in our great financial need, should receive the report "with open arms" in order to secure the monetary support which may be forthcoming if the recommendations are implemented by the Government. There is a grave danger, to my mind, that we, in order to enjoy freedom from financial embarrassment, may too lightly regard some of the recommendations which aim at changing some of the principles which have been cherished and fought for by our predecessors.

One thing in particular I am pleased to note is that the committee have given their blessing to the "one portal system." In this connection I was interested to read the other day that in the medical profession there is a move on foot to secure a "one portal system" of entry.

I should perhaps mention, for the benefit of those who have not read the report, that one of the principal recommendations is that veterinary education should be brought into closer touch with the Universities. With the exception of this school, the other colleges are but loosely connected with their respective Universities. It is also suggested that the Universities of Edinburgh, Glasgow, London and Liverpool should institute a pre-clinical degree to be awarded after the first three years of study. Such a degree would be awarded on examinations in Chemistry, Physics, Biology, Veterinary Anatomy, Physiology (General and Applied), Veterinary Pathology, Bacteriology and Parasitology and would not include the purely vocational subjects, *viz.*, Animal Management, Hygiene, Dietetics, Husbandry, Therapeutics, Toxicology, Medicine, Surgery and Obstetrics. The student would proceed to study these subjects for his disploma of M.R.C.V.S. after obtaining his degree. There is a great deal to be said for this scheme, but is it free from danger? Is there not a grave risk of students who have taken their pre-clinical degree at the completion of three or more years of study and who have failed to take their membership diploma "trading" on their degree? That is a question which should be considered and considered very seriously. Would it not be better for the Universities to award degrees which include examinations in the vocational subjects, as in Liverpool, and withhold the degree as at present until the student has obtained his membership diploma?

It is also recommended that the R.C.V.S. should be given power to include on its Council and Examination Committee representatives of the affiliated Veterinary Schools and Universities concerned in veterinary education. This, as you will appreciate, will be a departure from the system which has applied hitherto, namely, the selection of Council members by election. This change has given rise to apprehension in the minds of some as it allows of "laymen" becoming members of the Council of the R.C.V.S. If this recommendation is accepted, then of course this possibility exists, but, to my mind, I do not think it is as serious as some may think, as most schools will be represented by members of their professional staff.

The underlying theme in the whole report is that the veterinary surgeon of the future will be more and more concerned with the maintenance of stock in health and not purely with restoration to health. According to the report, the veterinary surgeon will be the guardian of the health of a vast population on our farms and thus safeguard a large part of the nation's wealth and become an important factor of national security. The report goes to to say, "We do not rest our case for a more generous treatment of the schools on the needs of dogs, cats, hacks, hunters and bloodstock . . . . The training of veterinarians to meet their needs may fairly claim generous support from private owners and from sporting organisations. Whilst we do not forget that the veterinarian must give advice on the health and ailments of these animals, yet it is on the national need of securing the health of farm animals that throughout this report we desire to concentrate attention."

Whilst the Committee are quite in order in emphasising the part that the profession should play as the guardian of animal health, we must see that "the pendulum does not swing too far" as we cannot lose sight of the fact that for many years most practitioners will depend for their income on their skill in diagnosis and treatment and that, after all, the prime purpose of the profession is the practice of veterinary medicine and surgery. Even supposing we do become the guardians of the health of the nation's livestock, as the report speaks of

it, and we do develop the preventive medicine outlook, where is our remuneration to come from? Is the farmer or stockowner expected to retain his or her veterinary surgeon on a "contract" basis as in the case of certain local authorities or owners of large studs of horses? In such circumstances there is no doubt that the supervision of the animals in health is to the advantage of the owner and the veterinarian concerned. But how can this scheme be made to apply to the average farmer? One knows that veterinary surgeons are rarely called in the absence of an ailing animal or some infectious disease which calls for treatment or eradication. And when this has been given, the veterinarian's services are no longer required.

What, then, had the Committee in mind when drafting their report? There is no doubt that it is an excellent ideal but is it applicable to conditions of the present-day or even the near future? No matter how well qualified we may be or how willing we are to adopt this new outlook, unless our advice is sought, the community will be no better off.

Does this new outlook on the part of the Committee envisage or forecast some such scheme as a National Health Insurance for animals? Personally I think it will be the only solution, and if my mental picture of the future is anywhere near being correct, it will be the next development. Not only will it make the veterinary surgeons' services available for advice regarding the maintenance of health, feeding, etc., but it will also provide the agricultural community in some remote rural areas with the services of a veterinarian which they are now unable to retain.

These are a few of the many aspects of veterinary education covered in the report. Whilst we appreciate the fact that the value of the profession has too long remained unrecognised and that veterinary education has been virtually starved, do not let this prospect of what, to us, appears to be vast wealth, blind us to the repercussions which a complete unqualified acceptance of the report may have on our profession.

Finally, I come to the poultry report. I had written a short survey of this publication, but as a request has come from the N.V.M.A. that a fairly lengthy published statement on this subject be read to you, I have decided, in order to avoid repetition, to delete these comments from my address. With your approval, then, I propose to proceed with the general business of the meeting. In doing so I would like once again to say how much I appreciate the honour of being your President and I trust that the year upon which we are entering will be one of progress, both for the "Lancashire" and the profession as a whole.

Diseases of Poultry.—The Secretary then read a letter from the Secretary of the N.V.M.A. and a reprint of an article from the *Veterinary Record* of November 5th, 1938, relating to the Report of the Poultry Technical Committee.

The recommendations of the N.V.M.A. that a course of lectures be arranged were discussed by the meeting and Professor Craig, Messrs. A. J. Wright, G. C. Webster and A. B. Mattinson contributed to the discussion. It was finally resolved that a course of lectures on Poultry Diseases and Husbandry be arranged by the Association.

The President now read the recommendations of the Sub-Committee, regarding the nature of the lectures, which were as follows:

(1) Virus Diseases.
(2) Other Contagious Diseases of Adult Birds.
(3) Diseases of Chicks.
(4) Parasites and Non-Specific Diseases.
(5) Breeding, Incubation and Rearing.

The recommendations of the Sub-Committee were accepted and the matter was referred to Council to arrange details.

Discussion on expenses involved followed and it was resolved that the Association pay expenses incurred. It was also resolved that a fee of £1 1s. be charged to non-members attending the course.

J. C. Baird, *Hon. Secretary.*

FOOT-AND-MOUTH DISEASE IN GERMANY

The Berlin correspondent of *The Times*, in a recent message to his paper, states that the damage done by the long-continued epidemic of foot-and-mouth disease in Germany is estimated by Professor Müssemeier, of Berlin, at not less than 1,000,000,000m. (£83,000,000), and continues: "Professor Müssemeier, who is the leading German expert on the subject, reports that in spite of preventive measures the infection has been more widespread in Germany than at any time in the past. Research during the last two years has, however, improved the prospects of getting the disease under control. Six hundred thousand cattle have now been immunised by the new vaccination process of the Riems Institute, but the institute cannot at the moment produce the vaccine in sufficient quantities to permit eradication of the disease. Extensions of manufacturing capacity are, however, in progress, and it is hoped that it will eventually be possible to prevent the disease from achieving the proportions of an epidemic."

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Protection of rural postmen from attacks by bulls was one of the questions considered by the Scottish Council of the Union of Post Office Workers at its annual meeting held in Greenock. It was stated that several such attacks had been noted recently, and it was decided to make representations to have the Post Office regulations brought into line with the law on the subject of attacks by bulls.

SOME CONTEMPORARY CONTRIBUTIONS TO OUR KNOWLEDGE OF ANIMAL HUSBANDRY

(*Continued from page* 464)

Pig Feeding Standards

In the same issue (Vol. xlv, No. 12, March, 1939) of the *Journal of the Ministry of Agriculture* as that containing the article on potato silage, by Mr. Stephen Williams, with which we dealt in this series last week, Dr. Crowther discusses the present position relating to feeding standards for pigs.

He points out that since feeding costs are a major factor in pig production, it is essential that reliable information regarding amount and kind of food at various ages and stages should be available. Various feeding standards have been drawn up from time to time in different countries. These show some differences mainly ascribable to differences in the pigs themselves and to the different systems under which they are kept.

So far as the standards of other countries are concerned, probably the Scandinavian most nearly resembles those widely adopted in Britain.

The use of the word "standards" must not be taken too literally. At best a "standard" foodstuff can only be a guide: the preferences and peculiarities of individual pigs must be studied and adjustments in amounts made within limits to suit individuals. Another point worth stressing is that quality of food can vary greatly in different samples. When using standards for feeding it is understood that the quality of the foodstuffs is good, and that the nutritive value is at least up to average for each class of food.

For the purpose of pig foods it is usual to assume an average starch equivalent of about 65 per cent. for the cereal meal mixture. This enables standards to be calculated on a basis of number of pounds of meal mixture actually fed (instead of number of pounds of starch equivalent), while since the pig digests about 75 per cent. of the protein in its meal mixture, it is convenient to take actual pounds of total protein rather than to estimate in pounds of protein equivalent. This has the further advantage that it is usual for invoices of pig foods (and pig food mixtures) to quote as a warranty the actual total protein content of the food, whereas it is seldom that protein equivalent figures are supplied as a routine procedure.

The Non-Pregnant Sow.

It is necessary to discriminate between the young gilt, which has not yet completed its normal body growth and the adult sow which is mature.

Actual experimental work carried out on the food requirements of non-pregnant females is scanty. Scandinavian and British standards accord fairly well however.

A gilt of 260 lb. live weight, reared for breeding, requires about 6·5 lb. of meal containing about 0·66 lb. (or 10 per cent.) of protein. As growth increase falls off from this stage, food allowance can be reduced so that when adult only about 1 lb. per 100 lb. live weight is needed with about 0·33 lb. of protein intake. During this stage cereal meals with a small amount of weatings will cover the needs of the sow.

Pregnant Sow.

When pregnancy occurs extra provision of food is needed for the developing foetuses. Cambridge experiments show that about 20 lb. of protein is stored in the sow's body during pregnancy, and this corresponds to a daily amount of about 0·17 lb. To enable the sow to store this amount, an extra allowance of about twice the quantity — 0·33 lb. approximately — must be allowed per day. Since foetuses develop more rapidly in the later stages of gestation, the daily allowance in early pregnancy can well be less than ½ lb., and more later. As a guide, it is suggested that the following would be satisfactory:—

	Daily Amount of Extra Protein needed for Pregnancy.	Amount of Meal required Extra.
	lbs.	lbs.
For first 5 to 6 weeks after service	0·25	1·0
From 6 to 11 weeks ...	0·3	1·25
From 11 weeks till farrowing	0·4	1·75 to 2

The requirements would be well met by a meal consisting of three parts of cereal meals with one part of white fish meal.

Where a sow is running out at pasture during this period less supplementary meal may be needed if the grazing is good, but it is desirable always to supply some. Even the best pasture will not provide in one day's full grazing more than the equivalent of 2 to 3 lb. of dry meal.

The Suckling Sow.

Sow's milk provides the whole of the food intake of the young pigs during the first three to four weeks of life, and her feeding must be adequate to enable her to produce maximum amounts of good quality milk. Accurate standards of feeding are not possible as in the cow. It is not known whether the maintenance needs of the sow while lactating are different from what they are before parturition, but at least they cannot be less. Similarly, feeding for milk production can only be estimated.

Investigations show that the peak of lactation is from the second to the fourth week after farrowing and that the daily yield is about 15 lb. at this period. Sow's milk is about one-third richer than cow's milk, and assuming an equal food utilisation for milk production in sow and cow, we obtain the following calculation for starch equivalent: $2{\cdot}5 \times 1{\cdot}5 \times 1{\cdot}3$ lb. = 4·875 lb. (or 7 to 8 lb. of meal) for the secretion of 15 lb. of milk. Taking about 4 to 6 lb. of meal for maintenance, this gives a total of 11 to 14 lb. of total meal intake daily (to include maintenance and production) during the height of lactation.

A similar method of approach will give the protein requirements. Sow's milk contains about 6·2 per cent. of protein, and so in 15 lb. of milk produced there will be 0·93 lb. of protein. On a comparative basis with the cow, about one-and-a-half times the amount of digestible protein must be supplied in the food, which is given by about 2·0 lb. of total protein. This means about 2·25 lb. of protein intake to provide for maintenance and production. This corresponds well

with the Scandinavian standard of 0·5 lb. per 100 lb. live weight for a sow weighing about 450 lb., but Morrison's American standard at 1·6 to 1·7 lb. is lower.

If reduced to terms of actual feeding meals these standards require that the lactating sow of about 400 lb. live weight shall be given about 12 to 14 lb. daily of a meal mixture which contains about 20 per cent. protein when fed indoors. When out at grass she will require rather less. A ration which would provide this might be:—

Weatings ...	...	40 parts
Ground cereals ...	...	28 „
Linseed cake meal	...	10 „
White fish meal ...	...	12 „

From the end of the third week onwards the amount can be gradually reduced until at weaning 8 lb. of food containing only about 17 to 18 per cent. of protein will be sufficient.

Post-Weaning Requirements.

Much more information is available regarding requirements of pigs after weaning and numerous standards have been devised. Some of these vary considerably both in amount and in percentage of protein intake daily, but they are based essentially upon the appetite of the young pigs when fed two or three times daily, and this naturally varies with different pigs, different times of the year, and under different systems of management. Scandinavian standards mainly based upon records of pigs fed on meals with separated milk, have been devised for meal feeding only.

A comparison between Scandinavian, Harper Adams, and Cambridge standards, in relation to live weight of the pigs is given as follows:—

Live Weight of Pigs.	Amount of Food, expressed as Weight of Meal.		
	Cambridge.	Harper Adams.	Hausson (Scandinavian).
30	1·6	1·5 (1·65)	1·9
40	2·1	1·75 (1·95)	2·5
60	3·0	2·5 (2·8)	3·45
80	4·0	3·3 (3·7)	4·15
100	4·6	3·9 (4·35)	5·0
120	5·3	4·45 (5·0)	5·8
140	5·9	5·0 (5·6)	6·3
160	6·45	5·6 (6·25)	6·7
180	6·7	6·05 (6·75)	7·1
200	7·0	6·6 (7·4)	7·55

Note.—Figures in brackets give the average consumption, when excluding certain pigs which for various reasons did not thrive and grow well. The other figure in the Harper Adams column includes these " poor-doing " pigs.

Protein standards also vary very much. Most work has been done on what is probably more than adequate protein, and not with protein cut down in some groups to be below the minimum requirements, whereby growth and health are obviously affected. The Scandinavian standards are probably (in the opinion of the author) most nearly the ideal which can be economically utilised under commercial methods.

These are:—

Live Weight.	Total Protein.	Per cent. Protein in Ration.
30	0·320	20
40	0·375	17·8
60	0·460	15·3
80	0·545	13·6
100	0·615	13·4
120	0·660	12·5
140	0·690	11·7
160	0·720	11·2
180	0·740	11·0
200	0·750	10·7

To give an indication of the types of meal mixtures which will give these amounts, the following mixtures are suggested, using ground cereal meals, weatings, white fish meal and soya bean meal. The mixtures are not necessarily recommended; they are given as illustrations. The proportions may be readily varied to suit market prices and individual needs.

Live Weight of Pigs.	Per cent. of Ground Cereal Meals.	Per cent. Weatings.	Per cent. White Fish Meal.	Per cent. Soya Bean Meal.
30	33	50	12	5
40	44	43	8	5
60	60	31	4	5
80	65	30	2	3
100	66	30	2	2
120	72	25	1	2
140	75	24	—	1
160	79	21	—	—
180	82	18	—	—
200	88	12	—	—

It should be clearly appreciated that vitamin and mineral supplies must be provided in addition. (Details of vitamin needs of pigs and other farm animals are referred to in other articles in this series: *vide Veterinary Record*, vol. **51.**, p. 427.)

In conclusion, emphasis is placed upon the major part which an intelligent and conscientious stockman can play in modifying amounts, frequencies, times of feeding and general management. The rate of progress of the pigs must be watched carefully and necessary adjustments made from time to time if the greatest success is to be achieved. Accurate recording of weights at regular intervals can be of the greatest assistance in determining the success or otherwise of a system of rationing.

At a meeting held during Norwich spring show of stallions, presided over by Colonel J. F. Barclay, it was decided to form a society to be known as the Norfolk Light Horse Breeding Society. A committee was appointed, to be presided over by Colonel Barclay and to include the four Masters of Hunt in the county.

At present the premium stallion allocated to Norfolk by the Hunters Improvement and National Light Horse Breeding Society is under the control of the Light Horse Breeding Committee of the Royal Norfolk Agricultural Society.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

April 21st.—Meeting of the Sussex Division, N.V.M.A., at Brighton, 2.45 p.m.

April 21st.—Meeting of the Mid-West Division, N.V.M.A., at Bath, 2.30 p.m.

April 24th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 4 p.m.

April 25th.—Meeting of the Ladies' Guild (V.V.B.F.) at 10, Red Lion Square, W.C.1, 3 p.m.

April 28th.—Meeting of the Royal Counties Division, N.V.M.A., at Aylesbury.

May 4th.—R.C.V.S. Council Election. Last day for nominations.

May 8th.—Animal Management Examination begins.

May 15th.—Rome Congress on Comparative Pathology begins.

May 18th.—R.C.V.S. Council Election Voting Papers issued.

May 25th.—R.C.V.S. Council Election Voting Papers due.

June 1st.—**Annual General Meeting, R.C.V.S.**

June 8th.—D.V.S.M. Examination begins.

June 20th.—R.C.V.S. Committee Meetings.

June 21st.—R.C.V.S. Committee Meetings.

June 21st.—**R.C.V.S. Annual Dinner.**

June 22nd.—R.C.V.S. Committee Meetings.

June 23rd.—R.C.V.S. Committee and **Council Meetings.**

July 23rd—28th.—N.V.M.A. Congress at Great Yarmouth and Gorleston-on-Sea.

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NATIONAL SERVICE—CENTRAL REGISTER

We would draw the attention of all members of the profession to the letter recently issued over the signature of the President and the Registrar, R.C.V.S., inviting them to complete the forms circulated by the National Service Department of the Ministry of Labour. Members are urged carefully to study Appendices I and II before completing these forms, in order that the most effective use of the varied services which the profession can offer may be made immediately available to the country. The earliest possible compliance with this request is imperative, though we share the hopes of all that the need to implement these intimations of willingness to serve in time of national emergency may not arise.

PERSONAL

As intimated in our Reports section this week, Colonel James Irvine-Smith, C.B.E., M.R.C.V.S., the Director of the Abattoir, Live Stock Markets, Veterinary Services, etc., of the City of Johannesburg, will retire in August after over 32 years' service.

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Colonial Veterinary Service Promotions.—The following promotions in the Colonial Veterinary Service are announced: Mr. R. L. Creery, M.R.C.V.S. (Veterinary Officer), to be Senior Veterinary Officer, Kenya; Mr. W. G. Emerson, M.R.C.V.S. (Veterinary Officer), to be Senior Veterinary Officer, Kenya; and Mr. W. Fotheringham, M.R.C.V.S. (Veterinary Research Officer), as Senior Veterinary Research Officer, Kenya.

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Marriage.—Dougal—Hollingsworth: At Station Hotel, Perth, on March 30th, 1939, Laurence Dougal, M.R.C.V.S., Blairgowrie, to Claire Hollingsworth, Scone, late of Winchmore Hill, London.

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R.C.V.S. OBITUARY

Allan, William Drummond, Beech House, Rufford, Lancs, Captain late R.A.V.C. (T.F.) Graduated Liverpool, December 19th, 1907. Died April 3rd, 1939; aged 73 years.

McCarmick, Anthony, 44, Cardigan Road, Headingley, Leeds. Graduated New Edinburgh, April 19th, 1883. Died April 6th, 1939; aged 78 years.

Sherlock, Thomas Henry, Drogheda, Co. Louth, Eire. Graduated Edinburgh, December 21st, 1897. Died March, 1939.

Willis, William, Gruinard, Vernon Walk, Tadworth, Surrey. Graduated London, April 2nd, 1884. Died April 5th, 1939; aged 76 years.

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EASTER VAN-HORSE PARADE

Easter Monday's sunshine rendered this year's parade of vanners in Regent's Park even more of a Bank Holiday attraction than usual, and an enormous crowd lined the two-mile route which the entrants had to traverse after the judging had been completed. There was an entry of 577, and of these only 15 were absent. The quality of the horses and the general smartness of turn-out pleased the public greatly, and members of the London Van Horse Parade Society were proud to note how well they were achieving their object of improving the general condition of the light draught horse in London.

No fewer than 535 first prizes were awarded. Eight exhibits were given second prizes. The R.S.P.C.A. awarded a merit badge to each first prize winner, and the Hackney Horse Society presented silver medals to the best horses and ponies of the hackney type. Colonel Sir Arthur Erskine, Crown Equerry, and Lady Erskine attended the parade and presented the prizes.

Mr. Claud F. Goddard, chairman of the Society, presiding at luncheon after the parade, expressed thanks to Sir Arthur and Lady Erskine for presenting the prizes. He referred to the useful work of the Society on behalf of van and light draught horses, and mentioned that there were present at the parade a number of army officers from Finland who had come to England to buy 110 horses, which would be trained for the Olympic Games in Finland in 1940.

Sir Arthur Erskine congratulated the Society on the splendid turn-out of horses. Specimens of trade carts and carriages of the eighteenth century were a rarity, and even those of the nineteenth century were few. Fortunately, the Science Museum was organising an exhibition of old carriages, and he appealed to all connected with horse transport to prevent the destruction of old vehicles and to help, if possible, in tracing any that might be of interest.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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CO-OPERATION WITH THE PEOPLE'S DISPENSARY FOR SICK ANIMALS OF THE POOR

To the Editor of the Veterinary Record

Sir,—The letter from the President of the Royal College of Veterinary Surgeons places before us matters which have grown up around us much more slowly than is in general realised by the profession. The effect of its dramatic presentation is not by any means limited to the profession nor the Society mentioned therein. It is, indubitably, of greater extent in cause and effect than this letter, which invites us to add to these activities to which the profession has already pledged itself, discloses; *i.e.*, lending our professional assistance to societies and individuals who are in substantial penury at the time of needing our services.

From the beginning, I have reason to believe, no veterinary surgeon ever refused to give of his skill to an animal whose owner was unable to reward him. This time-honoured obligation to the animal is still honoured throughout the length and breadth of the country. There is no reason to believe that we veterinary surgeons will ever break this faith with the animals which are so circumstanced.

We are aware how, some years ago, our profession was becoming gravely concerned at the amount of suffering which was being unrelieved through incompetence on the part of well-meaning institutions and individuals. It is to our great credit that we sought to amend this state of affairs so that animals owned by poor persons might enjoy the benefits of that accumulated experience of the veterinary profession through its individual members acting in co-operation with organisations which had already been formed for the purposes of animal welfare in other and no less needy directions.

Few, if any, of our colleagues failed to respond with heart and hand to that reasoned appeal by the N.V.M.A. so to organise our time-honoured individual efforts that no animal in this country, irrespective of the circumstances of the owner, should be without our practical sympathy. These schemes enjoyed the blessing of the R.C.V.S., and have earned the appreciation of the animal-owning and general public to such an extent that one may in truth say to-day that our practical interests in this direction are embodied in our constitution.

To my mind the case may be set out in a few brief statements.

(1) With an unfailing practical sympathy the veterinary profession has, as from the beginning, recognised the existence of owners who are unable to pay for professional advice and/or treatment for their animals.

(2) While individual practical sympathy is still extended, we are so organised to-day under centralised and de-centralised schemes that the general public is aware of our efforts in this humanitarian work.

(3) The existing schemes practically cover the British Isles.

(4) The organised services are not monopolised, in as much as though the many associate and independent charitable societies operate as individuals, collecting and administering provincially, they are, nevertheless, under the auspices of a parent body or influenced thereby.

(5) These various societies came into this humanitarian work either by invitation or by application.

(6) While it has to be admitted that there have been some local difficulties, mostly of a very trivial nature and readily overcome, the schemes have operated smoothly and to the increasing benefit of all concerned, so that it is not too much to say that a very deep-rooted respect has been born in the mind of all concerned.

(7) To my mind, the essence of this respect is undoubtedly that efficiency with which the profession has served the main object, *i.e.*, the alleviation of suffering in animals of the poor.

(8) In my view, the foundation upon which this respect rests is that freedom with which those of us who are interested in this work give, in a practical manner, our personal attention to all animals coming through such agencies. Thus we are honoured and honouring in a common purpose.

(9) Not only do we enjoy freedom in discharging our responsibilities to all the animals, but we are also privileged to call in question the status of owners who would seek to abuse the intention of well-meaning subscribers, which is to alleviate the suffering in animals of necessitous persons. This, our public duty, cannot be over-stressed no matter how zealous we may be in our work.

(10) With rare exceptions we enjoy representation upon the various boards of management of the societies.

Summary.—The veterinary profession have by thought and deed recognised the worthy occasion wherein to extend their practical sympathy to the animals of the poor. They have successfully sought to put this into practice by associating themselves with established and approved charitable institutions so that their former individual efforts might be more tangible to and for the public. In these arrangements the associating bodies have fully respected the liaison with the veterinary profession.

It is requested that we extend, or consider extending, this work to embrace the P.D.S.A., London. In the light of our existing arrangements such a request is not unreasonable. But, as a thing of self-growth, many changes are considered necessary 'ere we can accept the

recommendations in terms of the R.C.V.S. letter.

Before we can consider lending ourselves to a service in which our skill would be but partially represented it is my submission that the following be recognised:—

(1) The exclusive right of the veterinary surgeon to examine and advise upon all animals brought to this charitable agency.

(2) The public privilege of the veterinary surgeon to safeguard the intention and rights of the subscribing public, by the attending veterinary surgeons enjoying the existing privilege of, when in doubt, questioning the status of any one who would seek to abuse funds subscribed for a specific purpose.

(3) Professional representation upon the board of management of the P.D.S.A.

(4) That this society shall not retain any premises which are or would become in redundant opposition to other charitable bodies which are already in receipt of professional assistance under the existing schemes of the N.V.M.A.

(5) That no new centres be opened by the P.D.S.A. without the consent of the N.V.M.A. and/or the local Division.

(6) That the P.D.S.A. forthwith desist from the use of their training centre to any extent beyond the training of personnel for the position of almoners, receptionists or attendants at the disposal of the veterinary surgeons who may become attached to this society.

It is my humble submission that we are so pledged to other bodies to discharge our professional duties in this work, as a profession, with a fidelity which they have every reason to expect, that for us to subscribe to any preferential treatment towards any other society is to prove very disloyal to those who have so generously come to our aid to assist us to provide the animals of the poor with a competent service.

I am, Sir,
Your obedient servant,
George Dykes.

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THE EXAMINATION OF THE HEART

To the Editor of the Veterinary Record

Sir,—I am pleased that Dr. Blount has entered into the discussion on "The Examination of the Heart." Some of us know of Dr. Blount's leaning towards physiology, and regret that he has passed to other fields of work to the great loss of veterinary physiology.

In Reply to Question 1.

It is a fact that the heart muscle must be "exercised" if full benefit is to be gained from treatment. I could quote many cases in which graduated exercise has probably been the most potent factor in recovery. On the other hand, I have seen cases, in which complete rest was advised, go steadily down hill in spite of medicinal treatment. I always advise that exercise in the horse shall be in hand, and in the case of the dog it should be off the lead. A dog off the lead will rest if he feels cardiac embarrassment, if he is on the lead he will struggle after his owner. A horse out of hand has not the same sense of self control, and therefore I avoid turning a "heart horse" out to grass.

Question 2.

The heart must be examined at rest, and after reasonable exercise, if a true estimate of its health and efficiency is desired. Many hearts show dysfunction only after exercise, but on the other hand, there are hearts which are apparently abnormal at rest, but which soon resume normal function when at exercise. The practitioner who limits his examination to the resting period is looking for trouble, but even he is in a better position than the many who completely ignore this important organ.

Question 3.

I do not know for certain what is the commonest cause of the jugular pulse observed in cows. It is frequently seen in animals in which no cardiac abnormality can be observed. I have supposed that it may be due in some way to a full rumen affecting venous drainage, or to the wave of "reverse oesophageal peristalsis" associated with cudding. It is feasible to suppose that the pressure of this "wave" may be directly transmitted to the right auricle or to the anterior vena cava.

Question 4.

It is a fact that palpitation may be due to causes other than an embarrassed myocardium. Such causes may arise in the sympathetic nervous system, the endocrine system or even in the digestive system. The electro-cardiograph has brought comfort to many, and also reduced the incidence of some palpitation when it has recorded a healthy myocardium.

Yours faithfully,
J. McCunn.

Royal Veterinary College and Hospital,
Great College Street,
Camden Town,
London, N.W.1.
April 4th, 1939.

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"CASH" CAPTIVE BOLT PISTOLS

To the Editor of the Veterinary Record

Sir,—An advertisement recently issued by the manufacturers of a captive bolt pistol announces that their product is "solely recommended by the National Veterinary Medical Association."

This claim was no doubt based upon the report of the Special Committee appointed by the Association to study Small Animal Euthanasia.

Unfortunately, through a misunderstanding, the Committee used a "Small Cash" Pistol, designed for the stunning of sheep and calves, instead of a standard "Cash" for their series of tests.

The "Cash" has a bolt one inch longer and a cartridge of more than double the power of that of the "Small Cash" and is used extensively for the destruction of all breeds and sizes of dogs and in every case causes complete shattering of the medulla.

In view of the wrong impression created the Committee very kindly agreed to the inclusion of the following "erratum" in all copies of the report now being issued:—

"Since the printing of this report the attention of the Committee has been called to the fact that Messrs. Accles & Shelvoke, Ltd., manufacture a 'Cash' Pistol with penetration of bolt one inch deeper than that of the 'Small Cash' and using cartridges of more than double the power."

You will appreciate that many copies already distributed cannot contain this and considerable harm may be done to our business as a result.

We should be grateful, therefore, if you will publish this letter in your next issue.

Yours faithfully,
Accles and Shelvoke, Ltd.
G. E. Shelvoke,
Director.